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AIA® Document A101® – 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the Seventh day of January in the year Two Thousand and Twenty Two
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

City of Minot
515 2nd Ave. SW
Minot, ND 58702

and the Contractor:
(Name, legal status, address and other information)

Rolac Contracting, Inc.
2730 30th St. NW
Minot, ND 57703

for the following Project:
(Name, location and detailed description)

21019 – Minot City Hall Rehabilitation City Project 4466
Total rehabilitation of 45,658 square feet of existing construction into the new city hall for Minot, ND.

The Architect:
(Name, legal status, address and other information)

JLG Architects
416 E. Main Ave.
Bismarck, ND 58501

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101®–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201®–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

Init.
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EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

[X] The date of this Agreement.

[ ] A date set forth in a notice to proceed issued by the Owner.

[ ] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
(Check one of the following boxes and complete the necessary information.)

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[ ] Not later than Four Hundred and Fifty (450) calendar days from the date of commencement of the Work.

[ ] By the following date:

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date
N/A	

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be Nine Million Five Hundred Twenty Thousand Two Hundred Fifty Dollars and Zero Cents ($ 9,520,250.00), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price
Alternate 1 – Exterior Wall Insulation	$254,050.00
Alternate 2 - Exterior Curtainwall/Storefront Replacement	$695,000.00
Alternate 3 – Exterior Entrance Improvements	$132,200.00
Alternate 4 – Increased Glazing	$44,000.00

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance
N/A		

§ 4.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

Item	Price
Landscape Allowance	$25,000.00

§ 4.4 Unit prices, if any:
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit ($0.00)
N/A		

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)

Reference Supplementary Conditions section 00 7300, Article 8.2

§ 4.6 Other:
(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

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ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

N/A

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the last day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the 20th day of the following month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than Thirty (30) days after the Architect receives the Application for Payment.
(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

.1 That portion of the Contract Sum properly allocable to completed Work;

.2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and

.3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and

.5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:
(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

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Reference Supplementary Conditions section 00 7300, Article 9.3

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

N/A

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

Reference Supplementary Conditions section 00 7300, Article 9.3

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
(Insert any other conditions for release of retainage upon Substantial Completion.)

N/A

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and

.2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

N/A

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)

0 % Zero

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

N/A

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§ 6.2 Binding Dispute Resolution
For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

[ ] Arbitration pursuant to Section 15.4 of AIA Document A201–2017

[X] Litigation in a court of competent jurisdiction located in Ward County, North Dakota

[ ] Other *(Specify)*

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION
§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:
(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

N/A

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS
§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:
(Name, address, email address, and other information)

Lance Meyer
1025 31st St. SE
Minot, ND 58701
Email: lance.meyer@minotnd.org

§ 8.3 The Contractor's representative:
(Name, address, email address, and other information)

Jason Sanders
Rolac Contracting, Inc.
2730 30th St. NW
Minot, ND 58703
Email: jason@rolac-nd.com

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User Notes:
(1482780754)

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:
(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

§ 8.7 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor
.2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds
.3 AIA Document A201™–2017, General Conditions of the Contract for Construction
.4 Exhibit B – HUD General Provisions (HUD Rider)
HUD Form 4010 – Federal Labor Standards

.5 Drawings

Number	Title	Date
See drawing index	Minot City Hall Rehabilitation Drawings	11/4/2021

.6 Specifications

Section	Title	Date	Pages
See Project Manual table of contents	Minot City Hall Rehabilitation Project Manual	11/4/2021	

.7 Addenda, if any:

Number	Date	Pages
Addendum 1	11/12/2021	
Addendum 2	11/18/2021	
Addendum 3r	11/29/2021	
Addendum 4	12/02/2021	

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract

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Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[ ] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017 incorporated into this Agreement.)

[ ] The Sustainability Plan:

Title	Date	Pages
N/A		

[ ] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
Project Manual	00 7300 Supplementary Conditions	11/4/2021	

.9 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

This Agreement entered into as of the day and year first written above.

DocuSigned by:
Shaun Sipma
E[illegible]

OWNER *(Signature)*

Shaun Sipma, Mayor
(Printed name and title)

DocuSigned by:

CONTRACTOR *(Signature)*

Jason Sanders, President
(Printed name and title)

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Additions and Deletions Report for
AIA® Document A101® – 2017

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 10:08:58 ET on 01/07/2022.

PAGE 1

AGREEMENT made as of the Seventh day of January in the year Two Thousand and Twenty Two

...

City of Minot
515 2nd Ave. SW
Minot, ND 58702

...

Rolac Contracting, Inc.
2730 30th St. NW
Minot, ND 57703

...

21019 – Minot City Hall Rehabilitation City Project 4466
Total rehabilitation of 45,658 square feet of existing construction into the new city hall for Minot, ND.

...

JLG Architects
416 E. Main Ave.
Bismarck, ND 58501

PAGE 2

[X] The date of this Agreement.

PAGE 3

[ ] Not later than Four Hundred and Fifty (450) calendar days from the date of commencement of the Work.

...

N/A

...

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be Nine Million Five Hundred Twenty Thousand Two Hundred Fifty Dollars and Zero Cents ($ 9,520,250.00), subject to additions and deductions as provided in the Contract Documents.

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Alternate 1 – Exterior Wall Insulation	$254,050.00
Alternate 2 - Exterior Curtainwall/Storefront Replacement	$695,000.00
Alternate 3 – Exterior Entrance Improvements	$132,200.00
Alternate 4 – Increased Glazing	$44,000.00

...

N/A

...

Landscape Allowance $25,000.00

...

N/A

...

Reference Supplementary Conditions section 00 7300, Article 8.2
PAGE 4

N/A

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the last day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the 20th day of the following month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than Thirty (30) days after the Architect receives the Application for Payment.
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Reference Supplementary Conditions section 00 7300, Article 9.3

...

N/A

...

Reference Supplementary Conditions section 00 7300, Article 9.3

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N/A

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N/A

...

0 % Zero

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N/A
PAGE 6

[X] Litigation in a court of competent jurisdiction located in Ward County, North Dakota

...

N/A

...

Lance Meyer
1025 31st St. SE
Minot, ND 58701
Email: lance.meyer@minotnd.org

...

Jason Sanders
Rolac Contracting, Inc.
2730 30th St. NW
Minot, ND 58703
Email: jason@rolac-nd.com
PAGE 7

.4 ~~AIA Document E203™ 2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:~~Exhibit B – HUD General Provisions (HUD Rider)
~~(Insert the date of the E203-2013 incorporated into this Agreement.)~~HUD Form 4010 – Federal Labor Standards

...

See drawing index	Minot City Hall Rehabilitation Drawings	11/4/2021

...

See Project Manual table of contents	Minot City Hall Rehabilitation Project Manual	11/4/2021

...

Addendum 1	11/12/2021
Addendum 2	11/18/2021
Addendum 3r	11/29/2021
Addendum 4	12/02/2021

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N/A

...

Project Manual	00 7300 Supplementary Conditions	11/4/2021

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User Notes: (1482780754)

Shaun Sipma, Mayor

Jason Sanders, President

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DocuSigned by:

Eric Hoffer

(Signed)

Project Manager, JLG Architects

(Title)

1/7/2022

(Dated)

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Project Manual

CITY OF MINOT

CITY HALL REHABILITATION

CITY PROJECT 4466

Minot, North Dakota

THESE PROGRESS DRAWINGS HAVE BEEN PREPARED BY THE ARCHITECT AND THE ENGINEERS TO INCLUDE ADDENDA, RFI'S, ASI'S AND CHANGE ORDERS ISSUED TO DATE.

THESE DRAWINGS ARE PREPARED AS A COURTESY AND ARE NOT PART OF THE FORMAL DOCUMENTS ISSUED FOR CONSTRUCTION AND BIDDING.

THESE DRAWINGS ARE NOT TO REPLACE ANY OF THE FORMALLY ISSUED ADDENDUM, RFI'S AND CHANGE ORDERS.

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JLG architects

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Bismarck, ND 58501
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Project Number: JLG 21019

Date: November 4, 2021

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SECTION 00 0105 - CERTIFICATIONS PAGE

CITY OF MINOT
CITY HALL REHABILITATION

MINOT, NORTH DAKOTA

Architect

I hereby certify that this Plan, Specification, or Report was prepared by me or under my direct supervision, and that I am a duly Registered Architect under the laws of the State of North Dakota.

Jennifer Burke Jackson, AIA **November 4, 2021**
Reg. No. 2366

Electrical Engineer

I hereby certify that this Plan, Specification, or Report was prepared by me or under my direct supervision, and that I am a duly Registered Professional Engineer under the laws of the State of North Dakota.

Jason Hunze, PE **November 4, 2021**
Reg. No. PE-4879

Structural Engineer

I hereby certify that this Plan, Specification, or Report was prepared by me or under my direct supervision, and that I am a duly Registered Professional Engineer under the laws of the State of North Dakota.

Kody Scharosch, PE **November 4, 2021**
Reg. No. PE-10770

Mechanical Engineer

I hereby certify that this Plan, Specification, or Report was prepared by me or under my direct supervision, and that I am a duly Registered Professional Engineer under the laws of the State of North Dakota.

Caleb Bulow, PE **November 4, 2021**
Reg. No. PE-7110

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SECTION 00 1113 - ADVERTISEMENT FOR BIDS

CITY OF MINOT
CITY HALL REHABILITATION
City Project 4466

MINOT, NORTH DAKOTA

Owner: City of Minot

Sealed proposals for Construction of the City Hall Rehabilitation will be received by the City of Minot, until 11:00 AM local time on Tuesday, November 30, 2021, when bids will be opened and read aloud.

The Information to Bidders, Form of Bid, Form of Contract, Form of Performance-Payment Bond, Drawings, Specifications, addenda, and other contract documents as prepared by JLG Architects may be examined at the following places: The Builders Exchanges in Fargo-Moorhead, Grand Forks, Bismarck-Mandan, Bismarck, Minot, and Dickinson, North Dakota; Minneapolis/St. Paul, Minnesota; Construction Connect and McGraw Hill/FWDodge.

Digital copies of the Bid Documents are available at no charge to Prime bidders at the offices of JLG Architects, Bismarck, ND.

Each bid must be accompanied by a separate envelope containing the contractor's license and bid security. The bid security must be in a sum equal to five percent of the full amount of the bid and must be in the form of a bidder's bond. A bidder's bond must be executed by the bidder as principal and by a surety, conditioned that if the principals bid is accepted and the contract awarded to the principal, the principal, within ten days after notice of the award, shall execute a contract in accordance with the terms of the bid, the bid bond, and any conditions of the governing body. Bids shall comply with North Dakota Century Code Chapter §48-01.2 as amended. If a successful bidder does not execute a contract within the time allowed, the bidder's bond shall be forfeited to the governing body and the project awarded to the next lowest responsible bidder.

No bidder may withdraw their bid within 60 days after the actual date of the opening thereof. The Bid Bond of the three lowest Bidders for each contract will be retained until the contract has been awarded and executed, but no longer than sixty (60) days after the date of the Bid.

All Bidders shall hold a valid North Dakota Contractor's license of the proper class for the full amount of the bid as required by North Dakota Law Sections §43-07-05 and §43-07-12 and shall enclose a copy of the license or Certificate of Renewal of the license in the same envelope as the Bidder's Bond. A Contractor shall be the holder of a license at least ten days prior to the date set for receiving Bids to be a qualified Bidder.

No bid will be read or considered which does not fully comply with the above requirements as to bond and licenses, and any deficient bid submitted must be resealed and returned to the bidder immediately.

Bids shall be in accordance with and submitted on the Bid form supplied within the Bid Documents. Failure to do so may result in rejection of the Bid. The Owner reserves the right to reject any and all bids and to waive any formalities therein, and rebid the project until a satisfactory bid is received.

Attention is called to the fact that compliance with CDBG-DR is required on this project and will include federal labor standards and Davis Bacon labor rates, Section 3 employment plan, and the Contractor must ensure that employees and applicants for employment are not discriminated against because of their race, color, religion, sex, or national origin. The City of Minot is an Affirmative Action/Equal Opportunity Employer and encourages all small and minority-owned firms and women's business enterprises to apply.

A Pre-Bid Conference will be held at the site on Thursday, November 18, 2021, at 10:00 AM local time.

END OF SECTION

SECTION 00 2113 - INSTRUCTIONS TO BIDDERS

PART 1 GENERAL

1.01 DEFINITIONS

A. Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement or Invitation to Bid, Instructions to Bidders, Bid Form, and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, and all addenda issued prior to execution of the Contract.

B. Definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201, or in other Contract Documents are applicable to the Bidding Documents.

C. Addenda are written or graphic instruments issued by the Architect prior to the execution of the Contract which modify or interpret the Bidding Documents by additions, deletions, clarifications, or corrections.

D. A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

E. The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids.

F. An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

G. A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

H. A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

1.02 BIDDER'S REPRESENTATIONS

A. The Bidder by making a Bid represents that:
   1. The Bidder has read and understands the Bidding Documents or Contract Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction.
   2. The Bid is made in compliance with the Bidding Documents.
   3. The Bidder has visited the site, become familiar with local conditions under which the Work is to be performed and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.
   4. The Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception.

1.03 BIDDING DOCUMENTS

A. Copies:

1. Prime bidders may obtain complete sets of the Bidding Documents in digital form from the issuing office designated in the Advertisement or Invitation to Bid in the number and for the deposit sum, if any, stated therein.
2. Bidding Documents may not be issued directly to Sub-bidders unless specifically offered in the Advertisement or Invitation to Bid, or in supplementary instruction to bidders.
3. Bidders shall use complete sets of Bidding Documents in preparing Bids; neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
4. The Owner and Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

1.04 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

A. The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall at once report to the Architect errors, inconsistencies, or ambiguities discovered.

B. Bidders and Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request which shall reach the Architect at least seven days prior to the date for receipt of Bids.

C. Interpretations, corrections, and changes to the Bidding Documents shall be made by Addendum. Interpretations, corrections, and changes to the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon them.

1.05 SUBSTITUTIONS

A. The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

B. No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least seven days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

C. If the Architect approves a proposed substitution prior to receipt of Bids, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.

D. No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

1.06 ADDENDA

A. Addenda will be transmitted to all who are known by the issuing office to have received a complete set of Bidding Documents.

B. Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

C. Addenda will be issued no later than three days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

D. Each bidder shall ascertain prior to submitting a Bid that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

1.07 PREPARATION OF BIDS

A. Bids shall be submitted on the forms included with the Bidding Documents.

B. All blanks on the bid form shall be legibly executed in a non-erasable medium.

C. Sums shall be expressed in both words and figures. In case of discrepancy, the amount written in words shall govern.

D. Interlineations, alterations, and erasures must be initialed by the signer of the Bid.

E. It is requested that a change in cost be submitted for all Alternates. Failure to submit a cost change for an alternate may result in the Owner not being able to put together the project desired and cause the bid to not be considered. If no change in the Base Bid is required, enter "No Change."

F. Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall make no additional stipulations on the bid form nor qualify the Bid in any other manor.

G. Each copy of the Bid shall state the legal name of the Bidder and the nature of legal form of the Bidder. The Bidder shall provide evidence of legal authority to perform within the jurisdiction of the contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached certifying the agents authority to bind the Bidder.

1.08 MULTIPLE PRIME BIDS

A. Per the requirements of the North Dakota Century Code, this project will be bid with multiple prime bids for General Construction (including civil, landscape, and structural work), Mechanical Construction and Electrical Construction.

B. Contractors may choose to submit a Single Prime Bid in lieu of, or in addition to, the multiple prime bid.

C. A Single Prime Bid can ONLY be awarded if the apparent low Single Prime Bid is less that the combined value of the apparent low Multiple Prime Bids

D. If a contractor chooses to submit both a Multiple Prime Bid and a Single Prime Bid, they must provide separate Bid Forms and Bid Bonds in separate envelopes.

1.09 RECEIPT AND OPENING OF BIDS

A. Bids shall be received by the Owner as defined in the Advertisement or Invitation for Bids - Section 00 1113.

B. Bids shall be deposited at the designated location prior to the time and date for receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened.

C. The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

D. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within 60 days after the actual date of opening thereof.

E. The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed and bonds, if required, have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn or (c) all Bids have been rejected.

1.10 SUBMISSION OF BIDS

A. Each bid must be submitted in a sealed envelope bearing the following information on the outside:
   1. NAME OF THE PROJECT:
   2. NAME OF THE BIDDER:
   3. ADDRESS OF THE BIDDER:
   4. The words: BID PROPOSAL FOR CONSTRUCTION WORK.

B. All bids and proposals for the construction of any public contract project are subject to the provisions of chapter §43-07-12 of the North Dakota Century Code. All bids and proposals for the construction of any public contract project subject to the provisions of this chapter must contain a copy of the license or certificate of renewal thereof issued by the secretary of state enclosed in the required bid bond envelope.
   1. No contract shall be awarded to any contractor unless they are a holder of a license in the class within which the value of the project shall fall as herein before provided. A contractor must be the holder of a license at least ten days prior to the date set for receiving bids to be a qualified bidder. A bid submitted without this information properly enclosed in the Bid Bond envelope shall not be read, nor considered, and shall be returned to the bidder.
   2. Attached to the sealed bid envelope shall be a separate sealed bid bond envelope containing a copy of the contractor's license or certificate of renewal issued by the North Dakota Secretary of State. The outside of the envelope shall contain the following information:
      a. NAME OF THE PROJECT:
      b. NAME OF THE BIDDER:
      c. ADDRESS OF THE BIDDER:
      d. The words: BID BOND AND CONTRACTOR'S LICENSE.

C. Oral, telephonic, telegraphic, facsimile, or other electronically transmitted bids will not be considered.

1.11 SUBCONTRACTS

A. The bidder is specifically advised that any person, firm, or other party to whom it is proposed to award a subcontract under this contract must be acceptable to the Owner. Cause for rejection include, but are not limited to the following:
   1. Unacceptable workmanship on past projects.
   2. Lack of cooperation and/or inability to meet construction schedules on past projects.
   3. Inadequate personnel to meet construction schedule.

B. The lowest bidder must submit to the Architect a complete list of all suppliers and subcontractors within seven days after the date of the bid. Inability to provide a list of acceptable subcontractors shall be just cause for rejection of the bidder's proposal.

1.12 MODIFICATION OF BIDS

A. A Bid may not be modified, withdrawn, or canceled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and each Bidder so agrees in submitting a Bid.

B. Prior to the time and date designated for receipt of Bids, a Bid submitted may be modified or withdrawn by notice to the party receiving Bids at the place designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder. Written confirmation over the signature of the Bidder shall be received, and date- and time-stamped by the receiving party on or before the date and time set for receipt of Bids. A change shall be so worked as not to reveal the amount of the original Bid.

C. Withdrawn Bids may be resubmitted to the date and time designated for the receipt provided that they are then fully in conformance with these Instructions to Bidder.

1.13 BID SECURITY

A. Each bid must be accompanied by a Bid Bond attached thereto, duly executed by the bidder, as principal and having as surety thereon a surety company approved by the Owner in the amount of 5% of the bid. Such BONDs shall be in compliance with Section §48-01.2-05-4 of the North Dakota Century Code as amended and the corporate SURETY issuing such BONDs will be listed in the current Department of Treasury Circular 570. As soon as the BID prices have been compared, the Owner will return the BONDs of all except the three lowest responsible BIDDERs. When the CONTRACT is awarded, the BONDs of the two remaining will be returned. The BOND of the successful BIDDER will be retained under the AGREEMENT, Performance BOND and Payment BOND have been executed and approved, after which it will be returned. Signatures of all parties will be notarized.

B. Bid Bonds shall be made payable to the Owner.

C. The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed and bonds, if required, have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn, or (c) all Bids have been rejected.

1.14 CONSIDERATION OF BIDS

A. Opening of Bids: The properly identified Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids may be made available to Bidders.

B. Rejection of Bids: The Owner shall have the right to reject any or all Bids. A Bid not accompanied by a required bid security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular is subject to rejection.

C. Acceptance of Bid (Award)
   1. It is the intent of the Owner to award a Contract to the lowest qualified Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available.
   2. Alternates, if any are accepted, will be accepted in the order they are listed on the Bid Form. The lowest qualified Bidder will be determined by the sum of the Base Bid and accepted Alternates.

1.15 TIME OF COMPLETION

A. Bidder agrees to commence work on or before a date to be specified in a written Notice to Proceed by the Owner and to fully complete the Construction Work as outlined in the project documents and as based on project alternates taken.

B. Date of Substantial Completion: 450 calendar days from the date of the agreement.

C. Liquidated Damages: If the Work is not Substantially Complete on or before the date specified or other date as granted by Change Order, the Contractor shall pay to the Owner as liquidated damages the sum of $1,500.00 for each calendar day of delay. If the Work has not achieved Final Completion by the date specified or other date as granted by Change Order, the Contractor shall pay to the Owner as liquidated damages the sum of $1,500.00 for each calendar day of delay. Any monies due to the Owner as liquidated damages will be deducted from any monies due or to become due to the Contractor under the Contract, or will be collected from the Contractor's surety. These sums are not to be construed in any sense as a penalty.

1.16 CONDITIONS OF WORK

A. Each bidder must inform themselves fully of the conditions relating to the construction of the project. Failure to do so will not relieve a successful bidder of their obligation to furnish all materials and labor necessary to carry out their work and must employ such methods and/or means as will not cause any interruption of, or interference with the work of any other contractor.

1.17 PRE-BID CONFERENCE

A. A Pre-Bid Conference will be held at the project site on Thursday, November 18, 2021, at 10:00 AM local time. Contractors shall meet at the project site. After the conference, bidders will be able to tour the site.

1.18 BUILDING PERMIT

A. The General Contractor shall include the cost of the building permit in their bid.

1.19 BUILDER'S RISK INSURANCE

A. The Owner will provide Builder's Risk Insurance.

B. See Section 00 7300 - Supplementary Conditions paragraph 11.3.1 for additional information.

1.20 SECURITY FOR FAITHFUL PERFORMANCE

A. Simultaneously with their delivery of the executed contract, each contractor shall furnish a Performance-Payment Bond as security for faithful performance of this contract and furnishing materials in connection with this contract. The surety on such bond or bonds shall be a duly authorized surety company satisfactory to the Owner. The amount of the bonds shall be 100% of the contract.

1.21 POWER OF ATTORNEY

A. Attorneys-in-fact who sign bonds on contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

1.22 LAWS AND REGULATIONS

A. The bidder's attention is directed to the fact that all applicable State laws, Federal laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout and they will be deemed to be included in the contract the same as though herein written out in full.

B. Bidders must hold a North Dakota Contractor's license, carry North Dakota Worker's Compensation Insurance, and conform to all governing laws of the State of North Dakota.

1.23 OBLIGATION OF BIDDER

A. At the time of the opening of bids, each bidder will be presumed to have inspected the site and to have read and become thoroughly familiar with the plans and contract documents (including all addenda). The failure or omission of any bidder to examine any form, instrument, or document shall in no way relieve any bidder from any obligation in respect to their bid.

1.24 STATE EXCISE AND USE TAX (SALES TAX)

A. In submitting the bid, the bidder is understood to have included in the bid price the state and local tax on all sales of building materials, supplies, and equipment to contractors, subcontractors, or builders for the erection of buildings or their alteration, repair, or improvement.

1.25 STORING MATERIALS OFF-SITE

A. Contractor may store materials off-site and receive payment for said materials. If it is desired by the Contractor to order and store materials off-site, there shall be prior agreement to any arrangement by the Owner and Architect before ordering or Application for Payment. Evidence shall be furnished to the Owner and Architect that the materials have been ordered, delivered and paid for. A Certificate of Insurance for materials stored off-site shall accompany other required information at the time of the Application for Payment. The location of the stored materials shall be acceptable to the Owner.

1.26 OWNER REQUIREMENTS OF THE CONTRACTOR

A. For Contract language that will be incorporated into AIA Owner-Contractor Agreements, see Project Manual Section 00 5000.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 00 2600 - PROCUREMENT SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes
   1. Requirements for submitting substitution requests for materials, products, equipment and methods of construction from those required by the Procurement Documents, during the procurement phase and prior to execution of the Owner/Contractor Agreement.

1.02 SUBSTITUTIONS (DURING THE PROCUREMENT/BIDDING PHASE)

A. The technical specification sections may have several materials, products, equipment and methods of construction specified under the same heading. Selection of a specified materials, products, equipment and methods of construction shall be at the option of the Bidder. Where materials, products, equipment and methods of construction are specified accompanied with the phrase "Or Equal", "Approved Substitution", or similar verbiage, the Bidder may submit materials, products, equipment and methods of construction for approval in accordance with the requirements of this Document.

B. No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect (or Construction Manager as applicable) at least seven working days prior to the date for receipt of Bids.
   1. Submit each request for substitution on the Architect's "Procurement Substitution Request Form" included at the end of this Section.
   2. Submit one materials, products, equipment and methods of construction per request form, either duplicated from the Project Manual or available from the Architect's office.
   3. Submittals not accompanied by this form properly filled in and endorsed, will be discarded without review. NO EXCEPTIONS.
   4. Where specified materials, products, and equipment are accompanied by a color, pattern or finish selection, requests for substitution shall include an actual sample of the proposed color, pattern or finish for review.
   5. Where multiple materials, products or equipment are specified within a single specification section, specifically identify which product you wish to substitute.

C. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or rejection of a proposed substitution shall be final.

D. Materials, products, equipment and methods of construction approved by this substitution procedure will be issued in an Addendum.

E. Refer to Section 01 2500 for requests for substitutions after execution of the Owner/Contractor Agreement.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

PROCUREMENT SUBSTITUTION REQUEST FORM

TO: JLG Architects
416 E. Main Ave.
Bismarck, ND 58501

Phone: 701-837-0302
Contact: Eric Hoffer
ehoffer@jlgarchitects.com

PROJECT: City of Minot, City Hall Rehabilitation, Minot, ND

Section Number _____ Section Title _____

Specified Product _____

Proposed Substitution _____

All of the following questions must be answered. Incomplete forms will be not be reviewed.

A. The following supporting data is attached:
□ Drawings □ Product Data □ Samples □ Tests □ Reports

B. Does the proposed substitution affect dimensions shown on Drawings, or functional clearances?
□ YES □ NO

C. Does the proposed substitution change the design or details shown on the Drawings?
□ YES □ NO

D. Does the proposed substitution affect other trades?
□ YES □ NO

E. Does the proposed substitution affect maintenance service, or source of replacement parts, if applicable?
□ YES □ NO

F. Does the proposed guarantee or warranty differ from that specified?
□ YES □ NO

G. If you indicated "YES" to Items B, C, D, E or F above, attach a thorough explanation on your company letterhead.

H. If there are other major differences between proposed substitution and specified product, attach a thorough explanation on your company letterhead.

I. The proposed substitution was used within the last 24 months on the following project:

Project Name _____

Location _____

Architect _____ Telephone No. _____

J. Has the proposed substitution been used on a JLG Architects project within the last 12 months?
□ YES □ NO
If yes, which project? _____

K. The undersigned states that the function, appearance and quality of the substitution item are equivalent or superior to the specified item.

Submitted By:

Signature _____ Firm _____

Address _____ _____

Telephone _____ Fax _____

Date _____ E-Mail _____

For Use By Design Consultant:

□ Accepted □ Accepted As Noted □ Not Accepted □ Received Too Late

Name _____ Signature _____

Date _____ Remarks _____

SECTION 00 4100 – BID FORM

To: City of Minot
515 2nd Ave. SW
Minot, North Dakota 58701

Date: December 7, 2021

Having examined all bidding requirements, general conditions, Specifications and Drawings entitled Minot City Hall Rehabilitation, Project 4466; dated: November 4, 2021 and addenda similarly entitled and numbered _____ , _____ , _____ , as prepared by JLG Architects, Prairie Engineering, CW Structural, and AE2S, and having visited the site and examined all conditions affecting the work, the undersigned agrees to furnish and pay for all labor, materials, and equipment for the following Construction Contract as required by the afore mentioned documents for the following proposals:

Stipulated Sum Base Bid for (Multiple Prime):

GENERAL CONSTRUCTION

_____Dollars, ($_____)

MECHANICAL CONSTRUCTION

_____Dollars, ($_____)

ELECTRICAL CONSTRUCTION

_____Dollars, ($_____)

Stipulated Sum Base Bid for (Single Prime*):

GENERAL, MECHANICAL, & ELECTRICAL CONSTRUCTION

_____Dollars, ($_____)

*The Single Prime bid can only be accepted if bid is less than the combined total of the apparent low Multiple Prime bids.

The undersigned agrees to perform **Alternates** (if required by Contract Documents) as described in the Contract Documents for the following cost as a change to the Base Bid Stipulated Sum stated above.

Alternate Number	Description	Amount
1	**Exterior Wall Insulation**	**ADD: .**
	State the amount to be ADDED to the Base Bid for addition of exterior wall insulation, as indicated in the drawings and specifications.	
2	**Exterior Curtainwall/Storefront Replacement**	**ADD: .**
	State the amount to be ADDED to the Base Bid for replacing the exterior curtainwall and storefront, as indicated in the drawings and specifications.	
3	**Exterior Entrance Improvements**	**ADD: .**
	State the amount to be ADDED to the Base Bid for improvements to the exterior entrance, as indicated in the drawings and specifications.	
4	**Increased Glazing**	**ADD: .**
	State the amount to be ADDED to the Base Bid for increasing the amount of glazing, as indicated in the drawings and specifications.	
5	**NanaWall at Council Chambers**	**ADD: .**
	State the amount to be ADDED to the Base Bid for the addition of NanaWall at Council Chambers, as indicated in the drawings and specifications.	
6	**HVAC Air Purification System**	**ADD: .**
	State the amount to be ADDED to the Base Bid for a HVAC Air Purification System, as indicated in the drawings and specifications.	
7	**Supergraphics**	**ADD: .**
	State the amount to be ADDED to the Base Bid for the addition of Supergraphics, as indicated in the drawings and specifications.	
8	**Replace Cooling Tower**	**ADD: .**
	State the amount to be ADDED to the Base Bid for replacement of the cooling tower, as indicated in the drawings and specifications.	
9	**Parking lot mill/overlay**	**ADD: .**
	State the amount to be ADDED to the Base Bid for addition of parking lot mill and overlay, as indicated in the drawings and specifications.	
10	**Replace Exterior Parking Lot Lighting**	**ADD: .**
	State the amount to be ADDED to the Base Bid for replacement of exterior parking lot lighting, as indicated in the drawings and specifications.	
11	**Exterior Precast Acid Cleaning**	**ADD: .**
	State the amount to be ADDED to the Base Bid for the addition of exterior precast acid cleaning, as indicated in the drawings and specifications.	
12	**Roofing**	**ADD: .**
	State the amount to be ADDED to the Base Bid for the addition of roofing, as indicated in the drawings and specifications.	

Note: This Bid Form shall be submitted in DUPLICATE.

SIGNED:

_____ , a (Sole Proprietorship) (Partnership) (Corporation).

Firm Name (strike through two)

_____

Street Address

_____

City, State ZIP code

Phone:_____ Fax:_____

_____ , _____

Signed By, Title

_____ , _____

Signed By, Title

_____ , _____

Signed By, Title

_____ , _____

Witnessed By, Title

1) Sole Proprietorship: Signature of Sole Proprietor in the presence of a witness who will also sign. Insert the words "Sole Proprietor" under the signature. Affix seal.
2) Partnership: Signature of all partners in the presence of a witness who will also sign. Insert the word "Partner" under each signature. Affix seal to each signature.
3) Corporation: Signature of a duly authorized signing officer(s) in their normal signatures. Insert the officer's capacity in which the signing officer acts, under each signature. Affix the corporate seal. If the bid is signed by officials other than the president and the secretary of the company, or the president/secretary/treasurer of the company, a copy of the by-law resolution of their board of director's authorizing them to do so, must be submitted with the Bid Form in the bid envelope.

END OF SECTION

SECTION 00 5000 - CONTRACTING FORMS AND SUPPLEMENTS

PART 1 GENERAL

1.01 Contractor is responsible for obtaining a valid license to use all copyrighted documents specified but not included in the Project Manual.

1.02 AGREEMENT AND CONDITIONS OF THE CONTRACT

A. The Agreement form is AIA A101.

B. The General Conditions are based on AIA A201 - 2017.

C. Exhibit B-Hud General Provisions ("HUD RIDER").

D. HUD Form 4010 Federal Labor Standards.

1.03 FORMS

A. Use the following forms for the specified purposes unless otherwise indicated elsewhere in Contract Documents.

B. Bond Forms:
   1. Bid Bond Form: AIA A310.
   2. Performance and Payment Bond Form: AIA A312.

C. Post-Award Certificates and Other Forms:
   1. Certificate of Insurance Form: ACORD Certificate of Insurance 25.
   2. Application for Payment Forms: AIA G702 with AIA G703 (for Contractors).

1.04 REFERENCE STANDARDS

A. AIA A101 - Standard Form of Agreement Between Owner and Contractor where the basis of Payment is a Stipulated Sum; 2017.

B. AIA A310 - Bid Bond; 2010.

C. AIA A312 - Performance Bond and Payment Bond; 2010.

D. AIA G702 - Application and Certificate for Payment; 1992.

E. AIA G703 - Continuation Sheet; 1992.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

HUD GENERAL PROVISIONS ("HUD RIDER")

The following terms and conditions apply to any contract for which any portion of the funding is derived from a grant made by the United States Department of Housing and Urban Development ("HUD"). In addition, Contractor/Subcontractor shall comply with the Federal Labor Standards Provisions set forth in Form HUD-4010, available at http://www.hud.gov/offices/adm/hudclips/forms/files/4010.pdf.

1. PROVISIONS REQUIRED BY LAW DEEMED INSERTED

Each and every provision of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein and the contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party the contract shall forthwith be physically amended to make such insertion or correction.

2. STATUTORY AND REGULATORY COMPLIANCE

Contractor/Subcontractor shall comply with all laws and regulations applicable to the Community Development Block Grant-Disaster Recovery funds appropriated by the Disaster Relief Appropriations Act, 2017 (Pub. L. 115-56) and the Bipartisan Budget Act of 2018 ("BBA"), (Pub. L. 115-123), including but not limited to the applicable Office of Management and Budget Circulars, which may impact the administration of funds and/or set forth certain cost principles, including the allowability of certain expenses.

3. BREACH OF CONTRACT TERMS

CITY OF MINOT reserves its right to all administrative, contractual, or legal remedies, including but not limited tosuspension or termination of this contract, in instances where the Contractor or any of its subcontractorsviolate or breach any contract term. If the Contractor or any of its subcontractors violate or breach any contract term, they shall be subject to such sanctions and penalties as may be appropriate. The duties andobligations imposed by the contract documents and the rights and remedies available thereunder shall bein addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

4. REPORTING REQUIREMENTS

The Contractor/Subcontractor shall complete and submit all reports, in such form and according to such schedule, as may be required by City of Minot. The Contractor/Subcontractor shall cooperate with all City of Minot efforts to comply with HUD requirements and regulations pertaining to reporting, including but not limited to 24 C.F.R. §§ 85.40-41 (or 84.50-52, if applicable) and 570.507.

5. ACCESS TO RECORDS

The State, City of Minot, the U.S. Department of Housing and Urban Development, the Comptroller General of the United States, or any of their duly authorized representatives, shall have, at any time and from time to time during normal business hours, access to any work product, books, documents, papers, and records of the Contractor and subcontractor which are related to this contract, for the purpose of inspection, audits, examinations, and making excerpts, copies, and transcriptions.

6. MAINTENANCE/RETENTION OF RECORDS

All records connected with this contract will be maintained in a central location and will be maintained for a period of at least three years following the date of final payment and close-out of all pending matters related to this contract. All contractors and all tiers of subcontractors must keep all payroll and benefit information for a period of five years from project substantial completion.

7. SMALL AND MINORITY FIRMS, WOMEN'S BUSINESS ENTERPRISES, AND LABORSURPLUS AREA FIRMS

The Contractor/Subcontractor will take necessary affirmative steps to assure that minority firms, women's business enterprises, and labor surplus area firms are used in subcontracting when possible. Steps include:

i. Placing qualified small and minority businesses and women's business enterprises on solicitation lists;

ii. Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;

iii. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority business, and women's business enterprises;

iv. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority business, and women's business enterprises; and

v. Using the services and assistance of the Small Business Administration, and the Minority Business Development Agency of the Department of Commerce.

8. RIGHTS TO INVENTIONS MADE UNDER A CONTRACT OR AGREEMENT

Contracts or agreements for the performance of experimental, developmental, or research work shall provide for the rights of the Federal Government and the recipient in any resulting invention in accordance with 37 CFR part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by HUD.

9. ENERGY EFFICIENCY

The Contractor/Subcontractor shall comply with mandatory standards and policies relating to energy efficiency issued in compliance with the Energy Policy and Conservation Act (Public Law 94-163).

10. TITLE VI OF THE CIVIL RIGHTS ACT OF 1964

The Contractor/Subcontractor shall comply with the provisions of Title VI of the Civil Rights Act of 1964. No person shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance.

11. SECTION 109 OF THE HOUSING AND COMMUNITY DEVELOPMENT ACT OF 1974

The Contractor/Subcontractor shall comply with the provisions of Section 109 of the Housing and Community Development Act of 1974. No person in the United States shall on the grounds of race, color, national origin, or sex be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with funds made available under this title. Section 109 further provides that discrimination on the basis of age under the Age Discrimination Act of 1975 or with respect to an otherwise qualified handicapped individual as provided in Section 504 of the Rehabilitation Act of 1973, as amended, is prohibited.

12. SECTION 504 OF THE REHABILITATION ACT OF 1973

The Contractor/Subcontractor shall comply with section 504 of the Rehabilitation Act of 1973 (29 U.S.C. § 94), as amended, and any applicable regulations.

The Contractor/Subcontractor agrees that no qualified individual with handicaps shall, solely on the basis of handicap, be excluded from participation in, be denied the benefits of, or otherwise be subjected to discrimination under any program or activity that receives Federal financial assistance from HUD.

13. AGE DISCRIMINATION ACT OF 1975

The Contractor/Subcontractor shall comply with the Age Discrimination Act of 1975 (42 U.S.C. § 6101 *et seq*.), as amended, and any applicable regulations. No person in the United States shall, on the basis of age, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under, any program or activity receiving Federal financial assistance.

14. DEBARMENT, SUSPENSION, AND INELIGIBILITY

The Contractor/Subcontractor represents and warrants that it and its subcontractors are not debarred or suspended or otherwise excluded from or ineligible for participation in Federal assistance programs subject to 2 C.F.R. part 2424.

15. CONFLICTS OF INTEREST

The Contractor/Subcontractor shall notify City of Minot as soon as possible if this contract or any aspect relatedto the anticipated work under this contract raises an actual or potential conflict of interest (as defined at 2 C.F.R. Part 215 and 24 C.F.R. § 85.36 (or 84.42, if applicable)). The Contractor/Subcontractor shall explain the actual or potential conflict in writing in sufficient detail so that the State is able to assess suchactual or potential conflict. The Contractor/Subcontractor shall provide City of Minot any additional

information necessary for City of Minot to fully assess and address such actual or potential conflict of interest.The Contractor/Subcontractor shall accept any reasonable conflict mitigation strategy employed by City of Minot, including but not limited to the use of an independent subcontractor(s) to perform the portion ofwork that gives rise to the actual or potential conflict.

16. SUBCONTRACTING

When subcontracting, the Contractor/Subcontractor shall solicit for and contract with such Contractor/subcontractors in a manner providing for fair competition. Some of the situations considered to be restrictive of competition include but are not limited to:

(i) Placing unreasonable requirements on firms in order for them to qualify to do business,

(ii) Requiring unnecessary experience and excessive bonding,

(iii) Noncompetitive pricing practices between firms or between affiliated companies,

(iv) Noncompetitive awards to consultants that are on retainer contracts,

(v) Organizational conflicts of interest,

(vi) Specifying only a *brand name* product instead of allowing *an equal* product to be offered and describing the performance of other relevant requirements of the procurement, and

(vii) Any arbitrary action in the procurement process.

The Contractor/Subcontractor represents to City of Minot that all work shall be performed by personnel experienced in the appropriate and applicable profession and areas of expertise, taking into account the nature of the work to be performed under this contract.

The Contractor will include these HUD General Provisions in every subcontract issued by it so that such provisions will be binding upon each of its subcontractors as well as the requirement to flow down such terms to all lower-tiered subcontractors.

17. ASSIGNABILITY

The Contractor/Subcontractor shall not assign any interest in this contract and shall not transfer any interest in the same (whether by assignment or novation) without prior written approval of City of Minot.

18. INDEMNIFICATION

Refer to general conditions Article 3.18 and as revised by the Supplementary Conditions.

19. COPELAND “ANTI-KICKBACK” ACT (Applicable to all construction or repair contracts)

Salaries of personnel performing work under this contract shall be paid unconditionally and not less often than once a month without payroll deduction or rebate on any account except only such payroll deductions as are mandatory by law or permitted by the applicable regulations issued by the Secretary ofLabor pursuant to the Copeland "Anti-Kickback Act" of June 13, 1934 (48 Stat. 948; 62 Stat. 740; 63 Stat. 108; Title 18 U.S.C. § 874; and Title 40 U.S.C. § 276c). The Contractor shall comply with all applicable "Anti-Kickback" regulations and shall insert appropriate provisions in all subcontracts
covering work under this contract to ensure compliance by subcontractors with such regulations and shall be responsible for the submission of affidavits required of subcontractors thereunder except as the Secretary of Labor may specifically provide for variations of or exemptions from the requirements thereof.

20. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

(Applicable to construction contracts exceeding $2,000 and contracts exceeding $2,500 that involve the employment of mechanics or laborers)

The Contractor/Subcontractor shall comply with Sections 103 and 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. §§ 327-330) as supplemented by Department of Labor regulations (29 C.F.R. part 5).

All laborers and mechanics employed by contractors or subcontractors shall receive overtime compensation in accordance with and subject to the provisions of the Contract Work Hours and Safety Standards Act, and the contractors and subcontractors shall comply with all regulations issued pursuant to that act and with other applicable Federal laws and regulations pertaining to labor standards.

21. DAVIS-BACON ACT

(Applicable to construction contracts exceeding $2,000 when required by Federal program legislation)

The Contractor/Subcontractor shall comply with the Davis Bacon Act (40 U.S.C. §§ 276a to 276a-7) as supplemented by Department of Labor regulations (29 C.F.R. part 5).

All laborers and mechanics employed by contractors or subcontractors, including employees of other governments, on construction work assisted under this contract, and subject to the provisions of the federal acts and regulations listed in this paragraph, shall be paid wages at rates not less than those prevailing on similar construction in the locality as determined by the Secretary of Labor in accordance with the Davis-Bacon Act.

22. TERMINATION FOR CAUSE (Applicable to contracts exceeding $10,000)

Refer to general conditions Article 14 and as revised by the Supplementary Conditions.

23. TERMINATION FOR CONVENIENCE (Applicable to contracts exceeding $10,000)

Refer to general conditions Article 14 and as revised by the Supplementary Conditions.

24. SECTION 503 OF THE REHABILITATION ACT OF 1973 (Applicable to contracts exceeding $10,000)

The Contractor/Subcontractor shall comply with section 503 of the Rehabilitation Act of 1973 (29 U.S.C. § 793), as amended, and any applicable regulations.

Equal Opportunity for Workers With Disabilities

A. The Contractor/Subcontractor will not discriminate against any employee or applicant for employment because of physical or mental disability in regard to any position for which the employee or applicant for employment is qualified. The Contractor/Subcontractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified individuals with disabilities without discrimination based on their physical or mental disability in all employment practices, including the following:

i. Recruitment, advertising, and job application procedures;

ii. Hiring, upgrading, promotion, award of tenure, demotion, transfer, layoff, termination, right of return from layoff and rehiring;

iii. Rates of pay or any other form of compensation and changes in compensation;

iv. Job assignments, job classifications, organizational structures, position descriptions, lines of progression, and seniority lists;

v. Leaves of absence, sick leave, or any other leave;

vi. Fringe benefits available by virtue of employment, whether or not administered by the Subcontractor;

vii. Selection and financial support for training, including apprenticeship, professional meetings, conferences, and other related activities, and selection for leaves of absence to pursue training;

viii. Activities sponsored by the contractor including social or recreational programs; and

ix. Any other term, condition, or privilege of employment

B. The Contractor/Subcontractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the act.

C. In the event of the Contractor/Subcontractor's noncompliance with the requirements of this clause, actions for noncompliance may be taken in accordance with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the act.

D. The Contractor/Subcontractor agrees to post in conspicuous places, available to employees and applicants for employment, notices in a form to be prescribed by the Deputy Assistant Secretary for Federal Contract Compliance Programs, provided by or through the contracting officer. Such notices shall state the rights of applicants and employees as well as the Contractor's/Subcontractor's obligation under the law to take affirmative action to employ and advance in employment qualified employees and applicants with disabilities. The Contractor/Subcontractor must ensure that applicants and employees with disabilities are informed of the contents of the notice (e.g., the Contractor/Subcontractor may have the notice read to a visually disabled individual or may lower the posted notice so that it might be read by a person in a wheelchair).

E. The Contractor/Subcontractor will notify each labor organization or representative of workers with which it has a collective bargaining agreement or other contract understanding, that the Contractor/Subcontractor is bound by the terms of section 503 of the Rehabilitation

Act of 1973, as amended, and is committed to take affirmative action to employ and advance in employment individuals with physical or mental disabilities.

F. The Contractor/Subcontractor will include the provisions of this clause in every subcontract or purchase order in excess of $10,000, unless exempted by the rules, regulations, or orders of the Secretary issued pursuant to section 503 of the act, as amended, so that such provisions will be binding upon each subcontractor or vendor. The Contractor/Subcontractor will take such action with respect to any subcontract or purchase order as the Deputy Assistant Secretary for Federal Contract Compliance Programs may direct to enforce such provisions, including action for noncompliance.

25. EXECUTIVE ORDER 11246
(Applicable to construction contracts and subcontracts exceeding $10,000)

The Contractor/Subcontractor shall comply with Executive Order 11246 of September 24, 1965, entitled "Equal Employment Opportunity," as amended by Executive Order 11375 of October 13, 1967, and as supplemented in Department of Labor regulations (41 CFR chapter 60).

During the performance of this contract, the Contractor/Subcontractor agrees as follows:

A. The Contractor/Subcontractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor/Subcontractor shall take affirmative action to ensure that applicants for employment are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

B. The Contractor/Subcontractor shall post in conspicuous places, available to employees and applicants for employment, notices to be provided by Contracting Officer setting forth the provisions of this non-discrimination clause. The Contractor/Subcontractor shall state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

C. The Contractor/Subcontractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor/Subcontractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.

D. The Contractor/Subcontractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer, advising the labor union or workers representative of the contractor's commitments under Section 202 of Executive Order 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

E. The Contractor/Subcontractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations and relevant orders of the Secretary of Labor.

F. The Contractor/Subcontractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by the rules, regulations and orders of the Secretary

of Labor, or pursuant thereto, and will permit access to books, records and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders.

G. In the event of the Contractor's/Subcontractor's non-compliance with the non-discrimination clause of this contract or with any of such rules, regulations or orders, this contract may be cancelled, terminated or suspended in whole or in part and the Contractor/Subcontractor may be declared ineligible for further government contracts in accordance with procedures authorized in Executive Order 11246 and such other sanctions as may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation or order of the Secretary of Labor, or as otherwise provided by law.

H. Contractor/Subcontractor shall incorporate the provisions of A through G above in every subcontract or purchase order unless exempted by rules, regulations or orders of theSecretary of Labor so that such provisions shall be binding on such contractor/subcontractor. The Contractor/Subcontractor will take such action with respect to any subcontract or purchase order as the contracting agency may direct as a means of enforcing such provisionsincluding sanctions for non-compliance, provided, however, that in the event the contractorbecomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the contracting agency, the Contractor/Subcontractor may request the United States to enter into such litigation to protect the interests of the United States.

26. CERTIFICATION OF NONSEGREGATED FACILITIES (Applicable to construction contracts exceeding $10,000)

The Contractor/Subcontractor certifies that it does not maintain or provide for its establishments, and that it does not permit employees to perform their services at any location, under its control, where segregated facilities are maintained. It certifies further that it will not maintain or provide for employees any segregated facilities at any of its establishments, and it will not permit employeesto perform their services at any location under its control where segregated facilities are maintained.The Contractor/Subcontractor agrees that a breach of this certification is a violation of the equal opportunity clause of this contract.

As used in this certification, the term "segregated facilities" means any waiting rooms, work areas,rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms, and otherstorage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation and housing facilities provided for employees which are segregated by explicit directive or are, in fact, segregated on the basis of race, color, religion, or national origin because of habit, local custom, or any other reason.

The Contractor further agrees that (except where it has obtained for specific time periods) it will obtain identical certification from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the equal opportunity clause; thatit will retain such certifications in its files; and that it will forward the preceding notice to such proposed subcontractors (except where proposed subcontractors have submitted identical certifications for specific time periods).

27. CERTIFICATION OF COMPLIANCE WITH CLEAN AIR AND WATER ACTS (Applicable to contracts exceeding $100,000)

The Contractor and all its subcontractors shall comply with the requirements of the Clean Air Act, as amended, 42 U.S.C. § 1857 *et seq.*, the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 1251 *et seq.*, and the regulations of the Environmental Protection Agency with respect thereto, at 40 C.F.R. Part 15 and 32, as amended, Section 508 of the Clean Water Act

(33 U.S.C. § 1368) and Executive Order 11738.

In addition to the foregoing requirements, all nonexempt contractors and subcontractors shall furnish to the owner, the following:

A. A stipulation by the Contractor or subcontractors, that any facility to be utilized in the performance of any nonexempt contract or subcontract, is not listed on the Excluded Party Listing System pursuant to 40 C.F.R. 32 or on the List of Violating Facilities issued by the Environmental Protection Agency (EPA) pursuant to 40 C.F.R. Part 15, as amended.

B. Agreement by the Subcontractor to comply with all the requirements of Section 114 of the Clean Air Act, as amended, (42 U.S.C. § 1857 c-8) and Section 308 of the Federal Water Pollution Control Act, as amended, (33 U.S.C. § 1318) relating to inspection, monitoring, entry, reports and information, as well as all other requirements specified in said Section 114 and Section 308, and all regulations and guidelines issued thereunder.

C. A stipulation that as a condition for the award of the contract, prompt notice will be given of any notification received from the Director, Office of Federal Activities, EPA, indicating that a facility utilized, or to be utilized for the contract, is under consideration to be listed on the Excluded Party Listing System or the EPA List of Violating Facilities.

D. Agreement by the Contractor that he will include, or cause to be included, the criteria and requirements in paragraph (A)through (D) of this section in every nonexempt subcontract and requiring that the Contractor will take such action as the government may direct as a means of enforcing such provisions.

28. LOBBYING (Applicable to contracts exceeding $100,000)

The Contractor/Subcontractor certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the Contractor/Subcontractor, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the Contractor/Subcontractor shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The Contractor shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000

and not more than $100,000 for each such failure.

29. BONDING REQUIREMENTS
(Applicable to construction and facility improvement contracts exceeding $100,000)

The Contractor/Subcontractor shall comply with City of Minot bonding requirements, unless they havenot been approved by HUD, in which case the Contractor/Subcontractor shall comply with the following minimum bonding requirements: *A bid guarantee from each bidder equivalent to five percent of the bid price.* The "bid guarantee" shall consist of a firm commitment such as a bid bond, certified check, or other negotiable instrument accompanying a bid as assurance that the bidder will, upon acceptanceof his bid, execute such contractual documents as may be required within the time specified.

(1) *A performance bond on the part of the Contractor*/Subcontractor *for 100 percent of the contract price.* A "performance bond" is one executed in connection with a contract to secure fulfillment of all the Contractor's/Subcontractor's obligations under such contract.

(2) *A payment bond on the part of the Contractor*/Subcontractor *for 100 percent of the contract price.* A "payment bond" is one executed in connection with a contract to assure payment as required by law of all persons supplying labor and material in the execution of the work provided for in the contract.

30. SECTION 3 OF THE HOUSING AND URBAN DEVELOPMENT ACT OF 1968 (As required by applicable thresholds)

A. The work to be performed under this contract is subject to the requirements of section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. § 1701u (section 3). The purpose of section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by section 3, shall, to the greatest extent feasible, be directed to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.

B. The parties to this contract agree to comply with HUD's regulations in 24 C.F.R. part 135, which implement section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the part 135 regulations.

C. The *Contractor*/Subcontractor agrees to send to each labor organization or representative of workers with which the *Contractor*/Subcontractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the Contractor's commitments under this section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.

D. The *Contractor* agrees to include this section 3 clause in every subcontract subject to compliance with regulations in 24 C.F.R. part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 C.F.R. part 135. The Contractor will not subcontract with any subcontractor where the subcontractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 C.F.R. part 135.

E. The *Contractor*/Subcontractor will certify that any vacant employment positions, including training positions, that are filled: (1) after the c*ontractor*/subcontractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 C.F.R. part 135 require employment opportunities to be directed, were not filled to circumvent the *Contractor*/Subcontractor's obligations under 24 C.F.R. part 135.

F. Noncompliance with HUD's regulations in 24 C.F.R. part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.

G. With respect to work performed in connection with section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. § 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible: (i) preference and opportunities for training and employment shall be given to Indians, and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of section 3 and section 7(b) agree to comply with section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

31. FAIR HOUSING ACT

Contractor/Subcontractor shall comply with the provisions of the Fair Housing Act of 1968 as amended. The act prohibits discrimination in the sale or rental of housing, the financing of housing or the provision of brokerage services against any person on the basis of race, color, religion, sex, national origin, handicap or familial status. The Equal Opportunity in Housing Act prohibits discrimination against individuals on the basis of race, color, religion, sex or national origin in the sale, rental, leasing or other disposition of residential property, or in the use or occupancy of housing assisted with Federal funds.

32. Federal Funding Accountability and Transparency Act (FFATA)

The Federal Funding Accountability and Transparency Act of 2006 (FFATA), as amended, was signed with the intent of reducing wasteful government spending and providing citizens with the ability to hold the government accountable for spending decisions. 2 C.F.R. § Part 170 outlines the requirements of recipients' in reporting information on subawards and executive total compensation under FFATA legislation. Any non-Federal entity that receives or administers Federal financial assistance in the form of: grants, loans, loan guarantees, subsidies, insurance, food commodities, direct appropriations, assessed and voluntary contributions; and/or other financial assistance transactions that authorize the non-Federal entities' expenditure of Federal fund, is subject to these requirements.

Prime contract awardees and prime grant awardees are required to report against subcontracts and subgrants awarded in the FFATA Subaward Reporting System (FSRS), the reporting tool for Federal prime awardees. This information reported will then by displayed on a public and searchable website: www.USASpending.gov.

33. Procurement

The Uniform Guidance procurement requirements (2 C.F.R. § Part 200, Subpart D) went into effect on July 1, 2018. These requirements are applicable to CDBG-DR funded projects, or as provided by 83 Federal Register 5844 VI A(1)(b)(2) permits a state grantee to elect to follow its own procurement policy. These

policies and procedures ensure that Federal dollars are spent fairly and encourage open competition at the best level of service and price.

34. Change Orders to Contracts

Refer to general conditions Article 7 and as revised by the Supplementary Conditions.

35. Environmental Review

Every project undertaken with Federal funds, and all activities related to that project, is subject to the provisions of the National Environmental Policy Act of 1969 (NEPA), as well as to the HUD environmental review regulations at 24 C.F.R. § Part 58- ENVIRONMENTAL REVIEW PROCEDURES FOR ENTITIES ASSUMING HUD ENVIRONMENTAL RESPONSIBILITIES. The primary purpose of this Act is to protect and enhance the quality of our natural environment. The HUD environmental review process must be completed before any Federal funds can be accessed for program-eligible activities.

The primary objectives of the HUD environmental review are to identify specific environmental factors that may be encountered at potential project sites, and to develop procedures to ensure compliance with regulations pertaining to these factors. The HUD environmental review is designed to produce program specific environmental review procedures in a program that can vary greatly in terms of scope of work.

36. Lead Based Paint

All housing units assisted using CDBG-DR funds must comply with the regulations regarding lead-based paint found at 24 C.F.R. § Part 35- LEAD-BASED PAINT POISONING PREVENTION IN CERTAIN RESIDENTIAL STRUCTURES.

37. Environmental Review Record

The Environmental Officer is responsible for maintaining a written record of the environmental review process. The ERR for all programs contains all the governmental review documents, public notices and written determinations or environmental findings required by 24 C.F.R. § Part 58- ENVIRONMENTAL REVIEW PROCEDURES FOR ENTITIES ASSUMING HUD ENVIRONMENTAL RESPONSIBILITIES as evidence of review, decision making and actions pertaining to a project of a recipient.

38. Flood Insurance Requirements

Grantees and subrecipients of Federal funding must ensure that procedures and mechanisms are put into place to monitor compliance with all flood insurance requirements as found in the Flood Disaster Protection Act of 1973, 24 C.F.R. § 570.605- NATIONAL FLOOD INSURANCE PROGRAM and 24 C.F.R. § 570.202- ELIGIBLE REHABILITATION AND PRESERVATION ACTIVITIES.

39. Duplication of Benefits

CDBG-DR funding intends to address the unmet needs of a community. The funds are supplemental to primary forms of assistance, including private insurance and FEMA funds. To avoid duplicative assistance and potential de-obligation of funding, Subrecipient must utilize all possible funding sources before

applying CDBG-DR dollars to a project. CDBG-DR programs are typically implemented after temporary disaster assistance programs, such as FEMA Individual Assistance which are not intended to make someone whole.
The Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended, 42 U.S.C. §5121 et seq., established the requirements for Duplication of Benefits (DOB) analysis.

40. Anti-Fraud, Waste and Abuse Checks

The Anti-Fraud, Waste and Abuse (AFWA) check is designed to identify discrepancies and risk-relevant issues in Applicant-provided information that may be indicative of fraud, waste, and/or abuse.

41. Affirmatively Furthering Fair Housing

The Fair Housing Act of 1968, as amended, 42 U.S.C. §3601, et seq., dictates that grantees are required to administer all programs and activities related to housing and urban development in a manner to affirmatively further the policies of the Fair Housing Act. Per the regulations of 24 C.F.R. § 570.601 and in accordance with Section 104(b)(2) of the Housing and Community Development Act of 1974, as amended, 42 U.S.C. §5301 et seq., for each community receiving a grant under Subpart D of this part, the certification that the grantee will affirmatively further fair housing shall specifically require the grantee to take meaningful actions to further the goals identified in the grantee's Assessment of Fair Housing (AFH) plan, conducted in accordance with the requirements of 24 C.F.R. § §§5.150-5.180 (Affirmatively Furthering Fair Housing) and take no action that is materially inconsistent with its obligation to affirmatively further fair housing.

42. Drug Free Workplace

The Drug-Free Workplace Act of 1988, as amended, 41 U.S.C. §81, as implemented by 24 C.F.R. § Part 24 Subpart F, §§983.251-983.262, requires that any grantee other than an individual must certify that it will provide a drug-free workplace. Any grantee found in violation of the requirements of this act may be subject to suspension of payments under the grant, suspension or termination of the grant or suspension or debarment of the grantee.

43. Timely Distribution of Funds

The Supplemental Appropriations for Disaster Relief Requirements, 2017 (Pub. L. 115-56), approved September 8, 2017 (Appropriations Act), as amended, requires that funds provided under the Act be expended within two (2) years of the date that HUD obligates funds to a grantee unless otherwise authorized via waiver of this requirement by the Office of Management and Budget (OMB). The OMB waived the two (2) year expenditure requirement under 83 FR 40314; however, the provision to expend one hundred percent (100%) of the total allocation of CDBG-DR funds on eligible activities within six (6) years of HUD's initial obligation of funds remains in effect. The six (6) year expenditure period commences with the initial obligation of funds provided under 83 FR 5844. Additionally, per 83 FR 5844, the provisions at 24 C.F.R. § 570.494 and 24 C.F.R. § 570.902, regarding timely distribution and expenditure of funds, are waived and an alternative requirement was established.

Furthermore, consistent with 31 U.S.C §1555 and OMB Circular No. A–11 (2017), if the Secretary of HUD or the President of the United States determines that the purposes for which the appropriation was made have been carried out and no disbursement has been made against the appropriation for two (2) consecutive fiscal years, any remaining unobligated balance shall be canceled and will be made unavailable for obligation or expenditure for any purpose.

44. Property Management and Distribution

Regulations governing property management and distribution of real property, equipment, financial obligations and return of un-obligated cash post program closeout can be found in 24 C.F.R. § 570.506, 2 C.F.R. § 200.310, 2 C.F.R. § 200.343 and 2 C.F.R. § 200.344(b). The standards of 24 C.F.R. § 570.506 apply to any real property under a CDBG award recipient's control acquired in whole or in part with CDBG funds in excess of $25,000.00. The recipient may not change the use or planned use of the property without proper notification to affected citizens and allowable time for comment by them. If the property is not a building for general government conduct, the use of the property may be changed with citizen approval if it either meets one of the national objectives as defined in 24 C.F.R. § 570.208 or if not, the recipient may either retain or dispose of the property for the changed use if the recipient's CDBG program is reimbursed in the amount of the current fair market value of the property, less any portion of the value attributable to expenditures of non-CDBG funds for acquisition of, and improvements to, the property. Following such reimbursement, the property will no longer be subject to any CDBG requirements.

45. Limited English Proficiency

Executive Order No. 13166, signed on August 11, 2000, requires programs, subrecipients, contractors, subcontractors, and/or developers funded in whole or in part with CDBG-DR financial assistance to ensure fair and meaningful access to programs and services for families and individuals with Limited English Proficiency (LEP) and/or deaf/hard of hearing. Fair access is ensured through the implementation of a Language Assistance Plan (LAP), which includes non-English-based outreach, translation services of vital documents, free language assistance services, and staff training. Vital documents are defined as depending on the importance of the program, information, encounter, or service involved, and the consequence to the LEP person if the information in question is not provided accurately or in a timely manner.

46. Personally Identifiable Information

In accordance with 2 C.F.R. § 200.303, regarding internal controls of a non-Federal entity, a grantee must guarantee the protection of all Personally Identifiable Information (PII) obtained. The program will enact necessary measures to ensure PII of all applicants is safeguarded as to avoid release of private information. If a contractor or employee should experience any loss or potential loss of PII, the program shall be notified immediately of the breach or potential breach.

47. Uniform Relocation Act

CDBG-DR funds are subject to the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (URA or Uniform Act), as amended. 49 C.F.R. § Part 24 requires relocation assistance for lower-income individuals displaced as a result of the demolition or conversion of a lower-income dwelling and requires one-for-one replacement of lower-income units demolished or converted to other uses.

48. Residential anti-displacement and relocation assistance plan. Per Section 104(d) of the Housing andCommunity Development Act of 1974 § 42.325

(a) Certification.

(1) As part of its consolidated plan under 24 CFR part 91, the recipient must certify that it has in effect

and is following a residential anti-displacement and relocation assistance plan.

(2) A unit of general local government receiving funds from the State must certify to the State that it has in effect and is following a residential anti-displacement and relocation assistance plan, and that it will minimize displacement of persons as a result of assisted activities. The State may require the unit of general local government to follow the State's plan or permit it to develop its own plan. A unit of general local government that develops its own plan must adopt the plan and make it public.

(b) Plan contents.

(1) The plan shall indicate the steps that will be taken consistent with other goals and objectives of the program, as provided in parts 92 and 570 of this title, to minimize the displacement of families and individuals from their homes and neighborhoods as a result of any assisted activities.

(2) The plan shall provide for relocation assistance in accordance with § 42.350.

(3) The plan shall provide one-for-one replacement units to the extent required by § 42.375.

49. Complaints and Appeals

Citizen comments on City of Minot's published Action Plan, any substantial amendments to the Action Plan, performance reports and/or other issues related to the general administration of CDBG-DR funds are welcomed throughout the duration of the grant. The Citizen Participation Plan is posted as a stand-alone document at www.minotnd.org. Complaints regarding fraud, waste, or abuse of government funds shall be addressed to the HUD Office of Inspector General Fraud Hotline by phone: 1-800-347-3735 or email: hotline@hudoig.gov.

50. Monitoring

As per CDBG regulation, 24 C.F.R. § 570.501(b), grantees of CDBG-DR funds are responsible for carrying out their programs to meet compliance with CDBG Program, statutory and regulatory requirements, including monitoring their project administrators, contractors and subcontractors. As such, throughout the application, planning, design, and implementation phase of the program, City of Minot will conduct internal monitoring of processes, procedures, policy, applications, planning, design, construction, and other applicable phases.

51. Procurement of Recovered Materials

A non-Federal entity that is a state agency or agency of a political subdivision of a state and its contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds $10,000 or the value of the quantity acquired during the preceding fiscal year exceeded $10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

Applicability

The Project or Program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

A. 1. (i) Minimum Wages. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section l(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible, place where it can be easily seen by the workers.

(ii) (a) Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefor only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(b) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB control number 1215-0140.)

(c) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

(d) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii)(b) or (c) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part

of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

2. Withholding. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract In the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work, all or part of the wages required by the contract, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

3. (i) Payrolls and basic records. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section l(b)(2)(B) of the Davis-bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5 (a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section l(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017.)

(ii) (a) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i) except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at *http://www.dol.gov/esa/whd/forms/wh347instr.htm* or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this subparagraph for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to HUD or its designee. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149.)

(b) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under 29 CFR 5.5 (a)(3)(ii), the appropriate information is being maintained under 29 CFR 5.5(a)(3)(i), and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(c) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by subparagraph A.3.(ii)(b).

(d) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under subparagraph A.3.(i) available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and Trainees.

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant ',to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by

the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under 29 CFR Part 5 shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR Part 3 which are incorporated by reference in this contract

6. Subcontracts. The contractor or subcontractor will insert in any subcontracts the clauses contained in subparagraphs 1 through 11 in this paragraph A and such other clauses as HUD or its designee may by appropriate instructions require, and a copy of the applicable prevailing wage decision, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this paragraph.

7. Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act Requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and HUD or its designee, the U.S. Department of Labor, or the employees or their representatives.

10. (i) Certification of Eligibility. By entering into this contract the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001. Additionally, U.S. Criminal Code, Section 1 01 0, Title 18, U.S.C., "Federal Housing Administration transactions", provides in part: "Whoever, for the purpose of . . . influencing in any way the action of such Administration..... makes, utters or publishes any statement knowing the same to be false..... shall be fined not more than $5,000 or imprisoned not more than two years, or both."

11. Complaints, Proceedings, or Testimony by Employees. No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

B. Contract Work Hours and Safety Standards Act. The provisions of this paragraph B are applicable where the amount of the prime contract exceeds $100,000. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which the individual is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in subparagraph (1) of this paragraph, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in sub paragraph (1) of this paragraph.

(3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contract, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act which is held by the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2) of this paragraph.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.

C. Health and Safety. The provisions of this paragraph C are applicable where the amount of the prime contract exceeds $100,000.

(1) No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

(2) The Contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act, (Public Law 91-54, 83 Stat 96). 40 USC 3701 et seq.

(3) The contractor shall include the provisions of this paragraph in every subcontract so that such provisions will be binding on each subcontractor. The contractor shall take such action with respect to any subcontractor as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

SECTION 00 7300 - SUPPLEMENTARY CONDITIONS

PART 1 - GENERAL

The following supplements modify, change, delete from, or add to the General Conditions of the Contract for Construction, AIA Document A201, 2017, and the Standard Form of Agreement Between Owner and Contractor, AIA Document A101, 2017. Where a portion of the General Conditions or Agreement are modified or deleted by these Supplementary Conditions, the unaltered portions of the General Conditions or Agreement shall remain in effect.

AIA DOCUMENT A201-2017

ARTICLE 1 GENERAL PROVISIONS

1.1 Basic Definitions

Add: 1.1.3.1 The term "provide" shall mean furnish and install in place.

1.1.5 After the paragraph, Add: The general character and scope of the Work is shown by the Drawings. Where a portion of the Work is fully drawn and the remainder is merely indicated, the portion fully drawn shall apply to all similar parts of the Work.

Add: 1.1.5.1 Figured dimensions on the Drawings shall be followed in preference to scaled measurements on the Drawings.

1.1.6 After the paragraph, Add: Where Specifications are abbreviated type, they indicate complete sentences in the same manner as when a note occurs in the Drawings. Omissions of words such as "the Contractor shall" and "as shown on the Drawings" is intentional. The words "shall" or "shall be" are to be supplied by inference.

Add: 1.1.6.1 Where a number is listed in the Specifications (as for gauges, weights, temperatures, amounts of time, etc.), the number shall be interpreted as that or better.

1.2 Correlation and Intent of the Contract Documents

Add: 1.2.4 In the case of an inconsistency between Drawings and Specifications or within either Document not clarified by addendum, the better quality or greater quantity of Work shall be provided.

Add: 1.2.5 As experienced Contractors and Subcontractors, it is assumed each Contractor and Subcontractor understands not all components may be shown on the Drawings including, but not limited to, fasteners, connectors and incidental supports. This shall not relieve the Contractors or Subcontractors from providing all materials, equipment, fasteners, and incidental components as required for a complete installation in accordance with the design intent.

Add: 1.2.6: In the case of a conflict between the HUD Rider and other contract provisions, the decision as to which provision prevails shall be made by the CDBG-DR grant administer.

1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

Add: 1.5.2.1 The Contractor(s) may retain one record set of Drawings and Project Manual(s).

1.6 Notice

1.6.1 omit the words "if a method for electronic transmission is set forth in the Agreement".

ARTICLE 2 OWNER

2.3 Information and Services Required of the Owner

2.3.6 Replace the text with: The Contractor(s) will be furnished as many sets of Drawings and Project Manuals as the Architect has available for distribution, but in no case less than one. If the Contractor(s) require additional sets, an electronic copy of the documents will be provided in Adobe PDF format with which the Contractor(s) may use to make additional copies at their expense.

ARTICLE 3 CONTRACTOR

3.1 General

Add: 3.1.1 Where multiple Prime Contracts are in effect the term "General Construction Contractor" means the Prime Contractor for General, Structural, and Civil construction. See Section 00 4100 - Bid Form for list of Prime Contractors. Where a Single Prime Contract is in effect, the terms "General Construction Contracotr", "Prime Contractor", and "General Contractor" mean the Contractor.

3.2 Review of Contract Documents and Field Conditions by Contractor

3.2.1 Add the words “including the geotechnical report (if any),” following the word "performed,".

3.3 Supervision and Construction Procedures

Add: 3.3.1.1 Where multiple Prime Contracts are in effect the General Construction Contractor’s schedule, prepared in accordance with Article 3.10.1 of these Supplementary Conditions, and progress of the work shall govern the work of the other contractor. The General Construction Contractor shall be responsible for the general coordination of the Work of all contractors with respect to the current construction schedule in order to maintain progress of the Work and to ensure the progress remains on schedule as if the General Construction Contractor were the single Prime Contractor. Each Contractor shall notify other contractors, within a reasonable time, of phases or items of the Work requiring incorporation of Work by the other contractors. The other contractors shall, after such notification and within a reasonable time, proceed with the furnishing, installing, laying out or incorporating their Work so as not to delay or impede the progress of the other contractors and the Work. Neither the Owner nor the Architect shall be responsible for the coordination of the Work between the Contractors.

Add: 3.3.1.2 Each Contractor shall be responsible for the regular and on-going coordination of their Work with the affected Work of other Contractors, and for maintaining and coordinating the progress of the Work in accordance with the construction schedule, prepared in accordance with Article 3.10.1 of these Supplementary Conditions for schedule requirements.

3.4 Labor and Materials

Add: 3.4.2.1 After the Contract has been executed, the Owner and Architect may consider requests for the substitution of products in place of those specified. The Owner and Architect may, but are not obligated to, consider only those substitution requests that are in full conformance with the conditions set forth in the General Requirements (Division 1 of the Specifications). By making requests for substitutions, the Contractor:

.1 represents that it has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to the product specified;

.2 represents that it will provide the same warranty for the substitution as it would have provided for the product specified;

.3 certifies that the cost data presented is complete and includes all related costs for the substituted product and for Work that must be performed or changed as a result of the substitution, except for the Architect's redesign costs, and waives all claims for additional costs related to the substitution that subsequently become apparent;

.4 agrees that it shall, if the substitution is approved, coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects; and

.5 represents that the request includes a written representation identifying any potential effect the substitution may have on the Project's achievement of a Sustainable Measure or the Sustainable Objective.

Add: 3.4.4 No trade shall commence Work until conditions are satisfactory for carrying out the Work properly, and surfaces to be covered are suitable.

Add: 3.4.5 Manufacturer's printed instructions covering details of installation shall be followed where not in conflict with these Specifications. If there is a conflict, notify the Architect and obtain Architect's approval before proceeding.

Add: 3.4.6 Completed Work shall be left plumb, level, true to line or plane, anchored securely in place, and free from damage.

Add: 3.4.7 Unless otherwise called for, all pieces of material shall be as large a stock size as is in conformity with standard good practice of the trade.

Add: 3.4.8 Except where in conflict with the Specifications, current manufacturer's printed instructions of herein specified proprietary products are made part of the Specifications.

Add: 3.4.9 The Owner shall be entitled to reimbursement from the Contractor for amounts paid to the Architect for reviewing the Contractor's proposed substitutions and making agreed-upon changes in the Drawings and Specifications resulting from such substitutions.

Add: 3.4.10 The Contractor shall provide all incidental materials and components including, but not limited to, fasteners, connectors, incidental supports and other components of construction as required for complete installation in accordance with the design intent.

3.5 Warranty

Add: 3.5.1.1 The Contractor further warrants that all products, materials and equipment provided under the Contract are asbestos-free as defined under current EPA Guidelines, and that they do not contain any other materials currently known to be hazardous.

3.7 Permits, Fees, Notices and Compliance with Laws

3.7.1 Change the word "...Contractor..." to read "...General Contractor..."

Add: 3.7.2.1 When the Contract Documents require Work better than that required by statute, the Contract Documents shall govern.

3.10 Contractor's Construction and Submittal Schedules

3.10.1 Replace the text with: The General Construction Contractor, promptly after being awarded the Contract, and in cooperation with other Prime Contractors, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work, and shall obtain and submit to the Architect written evidence of the other Prime Contractor's concurrence with that schedule. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schdeule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. The first payment will not be certified by the Architect until the construction schedule has been received by the Architect.

3.12 Shop Drawings, Product Data and Samples

Add: 3.12.6.1 If the Contractor or any Subcontractor uses a material, product or piece of equipment which requires modification(s) to any other portion of the Work, including mechanical and electrical Work, the Contractor or Subcontractor using that material, product or piece of equipment shall be responsible for coordinating all required modifications and shall bear the full cost of such modifications.

3.18 Indemnification

Add: 3.18.3 Contractor agrees to reimburse the City for all costs, expenses, and attorneys' fees incurred in establishing and litigating the indemnification coverage provided herein.

Add: 3.18.4 The provisions of this Section 3.18 shall continue after the termination of this Agreement.

ARTICLE 4 ARCHITECT

4.2 Administration of the Contract

4.2.3 Add to the end of paragrph: The Architect will not be responsible for the acts or omissions of the Owner.

ARTICLE 5 SUBCONTRACTORS

5.1 Definitions

Add: 5.1.3 Through subcontracts, Prime Contractor(s) shall require its subcontractors to be in full compliance with the terms of this Agreement, including the general and supplementary conditions and the HUD Rider.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

No supplement.

ARTICLE 7 CHANGES IN THE WORK

7.1 General

Add: 7.1.4 All proposals shall, at a minimum, include detailed breakdown and indicate the terms enumerated below. Item (a) constitutes the cost of labor, and items (a), (b), and (c) constitute the basic costs referred to under this Article 7.

(a) Labor costs, itemized by each trade involved, showing the hourly rates for each, and the hours required for the change. Labor rates shall be the same for extra and credit computations and shall be the actual rate paid the workmen, plus contractor's burden on labor, which shall be only the actual costs of fringe benefits, taxes on labor, worker's or workmen's compensation, insurance on labor as affected by payroll, unemployment taxes and insurance, including FICA and FUTA.

(b) Quantities of materials, equipment and supplies, at their actual cost, with unit costs indicated, plus applicable sales tax.

(c) The cost of subcontracted work, computed in the same way as provided for under this subparagraph.

(d) Overhead, profit or commission added after the above computations are complete. Such overhead, profit or commission shall be computed in accordance with the provisions of subparagraph 7.1.5.

Add: 7.1.5 Maximum allowances for Subcontractor's/Contractor's overhead and profit shall be as follows, expressed as a percentage of the basic cost of the change:

For Subcontractors:	a. 15% of the net cost of the additional Work.
For Contractor:	b. 5% of the net cost of the additional Work performed by Subcontractors
	c. 15% of the net cost of the work performed by Contractor's own forces.
	Add 5% to a and c for all changes of less than $500.00; deduct 5% from a and c for all changes over $10,000.00.

Overhead and profit shall include all bond premiums (if applicable), and will not be allowed on labor costs if overhead and profit is already included in hourly billing rate.

Add: 7.1.6 For proposed changes in the Work on the lump sum or time and material methods, the costs shall be determined as provided in this subparagraph. The Contractor shall submit an itemized list of quantities with the applicable unit costs and extended price for each, in such form and detail as required by the Architect.

Add: 7.1.7 Architect will prepare a cost reasonableness review of the Contractor's submitted proposed change order. Once the Owner's representative reviews the proposed change order and cost reasonableness review, the change order will be sent to the Contractor for execution. The Owner will then execute the change order.

7.2 Change Orders

7.2.2 Neither the Owner nor the Architect are responsible to give Notice of Change Orders to the surety.

7.3 Construction Change Directives

Change paragraph 7.3.1 to state "Construction Change Directives are not allowed." Remove all other subparagraphs.

ARTICLE 8 TIME

8.1 Definitions

Add: 8.1.3.1 Minor corrective Work and the replacement of defective Work or materials, and the adjustment of control apparatus, will not delay the determination that the Contract is Substantially Complete.

Add: 8.1.3.2 The date of Final Completion is the date certified by the Architect in accordance with Paragraph 9.10.2.

8.2 Progress and Completion

Add: 8.2.1.1 The Date of Substantial Completion and the Date of Final Completion are as specified in Section 00 2113 - Instructions to Bidders. If the Work is not Substantially Complete on or before the date specified or other date as granted by Change Order, the Contractor shall pay to the Owner as liquidated damages the sum of $1,500.00 for each calendar day of delay. If the Work has not achieved Final Completion by the date specified or other date as granted by Change Order, the Contractor shall pay to the Owner as liquidated damages the sum of $1,500.00 for each calendar day of delay. Any monies due to the Owner as liquidated damages will be deducted from any monies due or to become due to the Contractor under the Contract, or will be collected from the Contractor's surety. These sums are not to be construed in any sense as a penalty.

8.3 Delays and Extensions of Time

Add: 8.3.1.1 The following will not be considered justifications for extension of time unless due to one of the causes stated within Article 8:

a) Delay caused by Subcontractors or Supplier except if the Supplier goes out of business and another Supplier cannot be found in time to meet the schedule.

b) Shortage of workers.

Add: 8.3.1.2 Change Orders for extension of Contract Time shall be considered only under the following conditions or circumstances:

.1 As indicated in Paragraph 8.3.1. The burden of proof to substantiate the extension of time shall rest with the Contractor, including evidence that the cause was beyond their control. The Contractor shall be deemed to have had control of the supply of labor (except in the case of organized labor disputes), materials, equipment, methods, and techniques, and of the Subcontractors.

.2 A delay in the progress of the Work actually occurred as a result of one of the valid causes for time extension.

.3 Unusual delay in delivery solely due to a delay in transportation. An extension of time shall not be considered when delay in delivery is due to improperly scheduled delivery, or when an order has not been promptly and properly placed.

.4 Abnormal weather conditions. The Contractor shall consider the location of the Project, and shall recognize the existence of variations from severe deviations from average climatic conditions. Foul weather in and of itself shall not be a valid cause for a time extension. Time extensions resulting from abnormal weather shall not be considered unless a significant deviation from average seasonal climatic conditions occurred for an extended period of time, and the progress of the Work was delayed to a significant extent. The climatic conditions before and after the period for which the delay is sought shall be evaluated.

.5 Changes in the Work which significantly affect the progress of the Work. When the anticipated delay can be determined the extension will be made when the Change in Work is authorized by the Owner. When the anticipated delay cannot be determined, the Contractor shall estimate the additional time required, and a mechanism for all parties to determine the allowable delay. In such a case, the Architect will determine the time extension and the Contract Time adjusted accordingly by Change Order. For changes in the Work which affect only a portion or Phase of the entire project, the Owner reserves the right to grant a time extension only for that portion or Phase affected by the Change.

.6 Labor disputes except for lockouts over which the Contractor has control. The amount of time extension shall not be longer than the actual dispute period plus a reasonable time for mobilization, and such extension may be less than the actual dispute period depending on the effect the dispute had upon the progress of the Work.

.7 Unavoidable delays such as damage caused by severe weather, fire or other casualty to the Work; remediation of contaminants, pollutants, or hazardous materials or substances discovered after award of the Contract; litigation including without limitation bankruptcy proceedings; the acts of any federal, state or local government unit that directly result in delays; and other delays outside the control of the Party claiming the delay.

.8 Delays caused by Subcontractors shall be considered only under the conditions noted above.

.9 Time extensions may be granted through a change order for substantiated abnormal weather conditions, however, no change to the contract price will be granted.

Add: 8.3.1.3 Time extensions shall not be granted as a result of delays caused by improper scheduling, or by failure of the Contractor to have Shop Drawings or other required submittals submitted in sufficient time for review.

ARTICLE 9 PAYMENTS AND COMPLETION

9.1 Contract Sum

9.1.2 Add sentence at end: "The costs for overhead, profit and commission shall be determined in accordance with the provisions of subparagraph 7.1.5."

9.3 Applications for Payment

9.3.1 In the first sentence replace: "At least ten days before the date established for each progress payment," with: "Not more than once a month,".

9.3.2 Replace the text with: Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered to and suitably stored at the site for subsequent incorporation into the Work. Contractor shall not receive payment for materials and equipment stored off site. Payment for materials and equipment stored on the site shall be conditioned upon compliance

by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials or equipment, or otherwise protect the Owner's interest, including applicable insurance.

Add 9.3.4 Progress payments shall be made monthly upon application, in the amount of 90% of the Work completed and materials described under 9.3.2. For a Contract of over $100 thousand, the Architect will authorize the payment of 100% of the amount completed after a total of 5% of the Contract amount has been retained, providing progress on the Work is in accordance with or ahead of the Contractor's construction schedule and is satisfactory to the Architect and if the Contractor has filed a Consent of Surety with the Architect.

Add 9.3.5 Contractor shall submit payroll reports with each application for Payment in accordance with Davis-Bacon requirements. Federal Wage Standard Determinations follow this Section.

9.8 Substantial Completion

9.8.1 At the end of the paragraph Add: In all cases, the date of the Substantial Completion may not be earlier than the Certificate of Occupancy issued by the authority having jurisdiction. Minor corrective Work, the replacement of defective Work or materials, and the adjustment of control apparatus will not delay the determination of Substantial Completion. See paragraph 12.2.2.

9.8.2 At the end of the paragraph Add: Minor punch list items that do not interfere with using the Work as intended may be corrected between Substantial Completion and Final Completion.

9.10 Final Completion and Final Payment

9.10.2 After "warranties or specific Subcontractor warranties," DELETE "and (6)" and REPLACE WITH ", (6) written certification from Contractor in accordance with Final Inspection requirements of Section 01 7800, (7) all Contract Closeout submittals required by Section 01 7800, each submittal having been approved by the Architect, and (8)".

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

10.2 Safety of Persons and Property

Add: 10.2.8 The General Contractor shall be responsible for overall security on the project site, including securing fencing required by Section 01 50 00, and securing doors, windows and other access points to the building at the end of each work day. Any Work being performed during nights or on weekends shall be coordinated with the General Contractor so that the General Contractor may take any steps he deems necessary to ensure the site is secure when that Work is suspended for the day and that it remains secured until work commences again.

10.3 Hazardous Materials and Substances

10.3.1 In the second sentence after: "asbestos", Add: ", lead-containing materials,"

10.3.3 Add the language "and subject to limits and other terms of its liability insurance coverage" after "To the fullest extent permitted by law,"

ARTICLE 11 INSURANCE AND BONDS

11.1 Contractor's Insurance and Bonds

Modify paragraph 11.1.1 to read "Each Prime Contractor shall purchase and maintain, during the term of this agreement, insurance of the types and limits of liability, containing the endorsements, and subject

to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. Each Prime Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liabilty policy or as otherwise described in the Contract Documents. The City will be defended, indemnified, and held harmless to the full extent of any coverage actually secured by each Prime Contractor in excess of the minimum requirements set forth above. The duty to indemnify the City under this Agreement shall not be limited by the insurance required in this Agreement.

11.1.2 Replace the first sentence with: Each Prime Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required in the Agreement or elsewhere in the Contract Documents, covering the faithful performance of the Contract and the payments of all obligations arising thereunder.

11.1.3 Replace paragraph with: The Contract will not be executed by the Owner until the Owner has received, from Each Prime Contractor, the properly executed surety bonds specified in AIA A101-2017 Exhibit A Insurance and Bonds.

11.3 Waivers of Subrogation

Replace paragraph 11.3.1 with "Each Prime Contractor's insurance coverages shall comply with the requirements of this Agreement and shall include a "Waiver of Subrogation" waiving any right to recovery the insurance company may have against the City.

Delete paragraph 11.3.2.

11.5 Adjustment and Settlement of Insured Loss

11.5.1 At the end of the first sentence add: "except when the fiduciary consents to allow a party with a claim to settle directly with the insurer.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

No supplement.

ARTICLE 13 MISCELLANEOUS PROVISIONS

No supplement.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

14.2 Termination by the Owner for Cause

14.2.1.2 At the end of the Subparagraph Add "or in accordance with the Contract Documents".

Add: 14.2.1.5 files a bankruptcy petition or has a bankruptcy action commenced against it that is not discharged within 30 days of commencement of same, makes an assignment for the benefit of its creditors, has a receiver appointed to manage the Contractor's assets or otherwise becomes insolvent;

Add: 14.2.1.6 fails to maintain schedules as required by the Contract Documents, or fails to comply in a material way with design requirements of the Contract Documents, or fails to perform the Work in accordance with the Contract Documents.

14.2.4 Replace the text with: If the unpaid balance of the Contract Sum exceeds the direct and indirect consequential costs of completing the Work (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs), and other damages incurred by the Owner, such excess will be paid to the Contractor. If such costs and damages exceed such unpaid balance, the Contractor shall pay the difference to the Owner. Such costs incurred by the Owner will be approved as to reasonableness by the Architect, but when exercising any rights or remedies under this paragraph, the Owner shall not be required to obtain the lowest price for the Work performed. This obligation to payment shall survive termination of the Contract.

ARTICLE 15 CLAIMS AND DISPUTES

15.1.6 Claims for Additional Time

Add: 15.1.6.3 Claims for increase in the Contract Time shall set forth in detail the circumstances that form the basis for the Claim, the date upon which ease cause of delay began to affect the progress of the Work, the date upon which each cause of delay ceased to affect the progress of the Work, and the number of days' increase in the Contract Time claimed as a consequence of each such cause of delay. The Contractor shall provide such supporting documentation as the Owner may require including, where appropriate, a revised construction schedule indicating all the activities affected by the circumstances forming the basis of the Claim.

Add: 15.1.6.4 The Contractor shall not be entitled to a separate increase in the Contract Time for each one of the number of causes of delay which may have concurrent or interrelated effects on the progress of the Work, or for concurrent delays due to the fault of the Contractor

15.3 Mediation

15.3.1 modify "shall be subject to mediation" to "may be subject to mediation".

15.3.2 modify "The parties shall" to "The parties may".

15.4 Arbitration

Change 15.4.1 to read "Arbitration not allowed."

Delete all other subparagraphs.

AIA DOCUMENT A101-2017 EXHIBIT A

ARTICLE A.1 - GENERAL

Add: Reference to "all-risks" in this document shall mean builder's risk policy.

ARTICLE A.2 - OWNER'S INSURANCE

A.2.3 Required Property Insurance

A.2.3.1 Modify paragraph to read: Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of

subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3,1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Architect. Engineers Contractor, Subcontractors, and Sub subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees. This insurance is not intended to cover machinery, tools or equipment owned or rented by the Contractor that are utilized in the performance of the Work but not incorporated into the permanent improvements. The Contractor shall, at the Contractor's own expense, provide insurance coverage per Article A.3.3.2.5 for owned or rented machinery, tools or equipment which shall be subject to the provisions of the General Conditions, Article 11.3 Waivers of Subrogation.

A2.3.1.1 Modify the paragraph to read: A.2.3.1.1 Causes of Loss. The insurance required by this Section A.2.3.1 shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. Sub-limits, if any, are as follows:

ARTICLE A.3 - CONTRACTOR'S INSURANCE AND BONDS

A.3.1 General

A.3.1.1 Replace the third sentence with: The certificates will show the Owner and Architect as additional insured on the Contractor's Commercial General Liability and umbrella liability policy or policies.

Add: A.3.1.1.1 Proof of workmen's compensation insurance coverage shall be a copy of certificate of premium payment and proof of other insurance coverage shall be fully descriptive standard AIA or ACCORD Certificate of Insurance. The Certificate of Insurance portrays the Insurance Agent's description of coverages provided the Contractor.

A.3.2 Contractor's Required Insurance Coverage

A.3.2.1 Add to end of paragraph: The Architect and Owner assume no responsibility in the event that the limits set below are not adequate.

A.3.3 Contractor's Other Insurance Coverage

A.3.3.2.1 In fifth sentence replace "Owner" with "(General) Contractor". See Article 11.5 of both the General Conditions and Section 00 7300 Supplementary Conditions for additional information.

Add: A.3.3.2.1.1 If the Owner is damaged by the failure of the [General] Contractor to maintain this insurance, then the [General] Contractor shall bear all reasonable costs properly attributable thereto.

Add: A.3.3.2.1.2 In bidding, the [General] Contractor shall include the property insurance premium on an amount equal to 100% of his bid plus all his add alternates, plus [45% of this amount for other Contracts including plus] the portion of Architect's fee in connection with any loss. The Contract amount shall be adjusted for the "difference" between the premium on this estimated amount and the actual amount. The Contract will not be signed until the Owner has received from the General Contractor the proper policy and one copy thereof for insurance specified under this Article.

A.3.3.2.4 Add to end of paragraph: The Contractor shall provide this insurance if storing materials and equipment off-site. See article 9.3.2 of the General Conditions and Section 00 7300 Supplementary Conditions for additional requirements relating to materials or equipment stored off-site.

A.3.4 Performance Bond and Payment Bond

Delete second paragraph beginning "Payment and Performance Bonds..."

Add: A.3.4.1 Where there are State, Federal or other jurisdictional bond forms required by statute or regulation, the bond or bonds shall be on those forms, in the amount of 100% of the Contract amount.

Where no such requirements exist, the Contractor shall furnish both AIA A312 Performance and AIA A312 Labor and Material Payment Bond, current as of the date of the agreement. Each bond, Performance and Payment shall be in the amount of 100% of the Contract amount.

Add: A.3.4.2 The Contractor shall require the attorney-in-fact who executes the required surety bonds on behalf of the surety to affix thereto a certified and correct copy of the power of attorney.

Add: A.3.4.3 Bond amounts shall not exceed the single bond limit for the Contractor's bonding company as set forth in the Federal Register current as of the bid date.

END OF SECTION

SECTION 01 1000 - SUMMARY

PART 1 GENERAL

1.01 CONTRACT DESCRIPTION

A. Contract Type: Single or Multiple prime contracts, each based on a Stipulated Price as described in Document 00 5000 - Contracting Forms and Supplements.

1.02 DESCRIPTION OF ALTERATIONS WORK

A. Scope of demolition and removal work is indicated on drawings and specified in Section 02 4100.

1.03 OWNER OCCUPANCY

A. Owner intends to continue to occupy adjacent portions of the existing building during the entire construction period.

B. Owner intends to occupy the Project upon Substantial Completion.

C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

D. Schedule the Work to accommodate Owner occupancy.

1.04 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.

B. Provide access to and from site as required by law and by Owner:
   1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit.

C. Existing building spaces may not be used for storage.

D. Utility Outages and Shutdown:
   1. Limit disruption of utility services to hours the building is unoccupied.
   2. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 7 days notice to Owner and authorities having jurisdiction.
   3. Prevent accidental disruption of utility services to other facilities.

END OF SECTION

"General Decision Number: ND20210031 09/24/2021

Superseded General Decision Number: ND20200031

State: North Dakota

Construction Type: Building

County: Ward County in North Dakota.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.95 for calendar year 2021 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.95 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2021. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate,if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/01/2021
1	05/14/2021
2	05/28/2021
3	07/30/2021
4	09/03/2021
5	09/24/2021

* BOIL0647-006 01/01/2021

	Rates	Fringes
BOILERMAKER	$ 40.94	28.44

BRND0001-004 05/01/2018

	Rates	Fringes
BRICKLAYER	$ 32.38	13.72

ELEC0714-012 08/30/2021

	Rates	Fringes
ELECTRICIAN (Including Low		

Voltage Wiring).....$ 35.70 11.65+10.5%

ENGI0049-006 05/01/2020

	Rates	Fringes
POWER EQUIPMENT OPERATOR: (Roller).....	$ 33.15	19.70

IRON0512-014 05/03/2021

	Rates	Fringes
IRONWORKER (REINFORCING AND STRUCTURAL).....	$ 34.30	31.80

LABR0563-003 05/01/2021

	Rates	Fringes
LABORER (Carpenter Tender).....	$ 24.52	18.17

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* PLAS0633-001 05/01/2021

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	$ 33.88	16.87

PLUM0300-017 05/31/2021

	Rates	Fringes
PLUMBER.....	$ 35.08	17.65

PLUM0300-020 06/07/2021

	Rates	Fringes
PIPEFITTER.....	$ 38.19	17.42

SHEE9010-002 06/03/2019

	Rates	Fringes
SHEET METAL WORKER (HVAC Duct Installation Only).....	$ 30.65	17.60

SUND2012-020 08/18/2014

	Rates	Fringes
CARPENTER.....	$ 23.66	7.35
FORM WORKER.....	$ 16.38	6.24
INSULATOR - MECHANICAL (Duct, Pipe & Mechanical System Insulation).....	$ 17.39	2.10
LABORER: Common or General.....	$ 18.24	0.00
OPERATOR: Backhoe/Excavator/Trackhoe.....	$ 23.03	0.00
OPERATOR: Bobcat/Skid		

Steer/Skid Loader.....$ 21.51 0.00

OPERATOR: Crane.....$ 27.00 15.65

OPERATOR: Forklift.....$ 26.40 13.58

OPERATOR: Loader.....$ 21.00 12.45

PAINTER (Brush and Roller).....$ 18.18 0.00

TRUCK DRIVER: Dump Truck.....$ 20.95 0.00

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number,

005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the

Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION"

SECTION 01 2000 - PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Sum and Contract Time.

C. Change procedures.

D. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

A. Section 00 5000 - Contracting Forms and Supplements: Forms to be used.

1.03 SCHEDULE OF VALUES

A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.

B. Forms filled out by hand will not be accepted.

C. Submit Schedule of Values to the Architect at the earliest feasible date, but in no case later than seven days before the date scheduled for submittal of the initial application for payment.

D. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section.
   1. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports.
   2. Break principle subcontract amounts down into several line items.
   3. Round amounts off to the nearest whole dollar; the total shall equal the Contract Sum.
   4. For each part of the Work where an Application for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed, provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
   5. Margins of Cost: Show line items for indirect costs, and margins on actual costs, only to the extent that such items will be listed individually in Applications for Payment. Each item in the Schedule of Values and Application for Payment shall be complete including its total cost and proportionate share of general overhead and profit margin.
   6. At the Contractor's option, temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown as separate line items in the Schedule of Values or distributed as general overhead expense.

E. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
   1. Contractor's construction schedule.
   2. Application for Payment form.
   3. List of subcontractors.
   4. List of principal suppliers and fabricators.

F. Revise schedule to list approved Change Orders, with each Application For Payment.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Forms filled out by hand will not be accepted.

C. Execute certification by signature of authorized officer.

D. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.

E. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.

F. Submit three copies of each Application for Payment to the Architect by means ensuring receipt within 24 hours; one copy shall be complete, including waivers of lien, payroll reports, and/or similar attachments, when required.
   1. One approved copy will be retained by the Architect, one will be returned to the Contractor, and one forwarded to the Owner for their use in issuing payment.

G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment include the following:
   1. List of subcontractors: AIA G705.
   2. List of principle suppliers and fabricators.
   3. Schedule of Values: AIA G703.
   4. Contractor's Construction Schedule (preliminary if not final).
   5. Schedule of principal products.
   6. List of Contractor's staff assignments.
   7. Certificates of insurance and insurance policies.
   8. Performance and payment bonds: AIA A312.

H. Include the following with each application:
   1. Waivers of Mechanics Lien: Submit waivers of mechanics lien from every entity who may lawfully be entitled to file a mechanics lien arising out of the Contract, and related to the Work covered by the payment.
   2. HUD Certified payrolls and all required CDBG-DR documentation for Davis Bacon wage rates.
   3. Affidavits attesting to off-site stored products.

I. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment; this application shall reflect any Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
   1. Administrative actions and submittals that shall precede or coincide with this application include:
      a. Occupancy permits and similar approvals.
      b. Warranties (guarantees) and maintenance agreements.
      c. Testing, adjusting, and balancing reports.
      d. Maintenance instructions.
      e. Start-up performance reports.
      f. Change-over information related to Owner's occupancy, use, operation, and maintenance.
      g. Final cleaning.
      h. Application for reduction of retainage, and consent of surety.

i. List of incomplete Work, recognized as exceptions to Architect's Certificate of Substantial Completion.

1.05 MODIFICATION PROCEDURES

A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue Supplemental Instructions on AIA form G710 directly to Contractor.

B. Change Orders: For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 7 days.
   1. Owner-Initiated Proposal Requests: Proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time will be issued by the Architect, with a detailed description of the proposed change and supplemental or revised Drawings and Specifications, if necessary.
      a. Proposal requests issued by the Architect are for information only. Do not consider Proposal Requests as an instruction either to stop work in progress, or to execute the proposed change.
      b. Unless otherwise indicated in the proposal request, within 5 days of receipt of the proposal request, submit to the Architect for the Owner's review an estimate of cost necessary to execute the proposed change.
      c. Include a list of quantities of products to be purchased and unit costs, along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
      d. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
      e. Include a statement indicating the effect the proposed change in the Work will have on the Contract Time.
   2. Contractor-Initiated Change Order Proposal Requests: When latent or other unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Architect.
      a. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
      b. Include a list of quantities of products to be purchased and unit costs along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
      c. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
      d. Comply with requirements in Section "Product Substitutions" if the proposed change in the Work requires the substitution of a product or system for a product or system specified.
   3. Proposal Request Form: Use AIA Document G709 for Change Order Proposal Requests.

C. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
   1. Maximum allowances for Subcontractor's/Contractor's overhead and profit as expressed as a percentage of the basic cost of the change:
      a. Subcontractors: 15% of the net cost of the additional Work.
      b. Contractors: 5% of the net cost of the additional Work performed by subcontractors.
      c. Contractors: 15% of the net cost of work performed by the contractor's own forces.
      d. Add 5% to above allowances for changes of less than $500.00.
      e. Deduct 5% from above allowances for changes greater than $10,000.00.

f. Overhead and profit shall include all bond premiums (if applicable), and will not be allowed on labor costs if overhead and profit is already included in hourly billing rate.

D. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

E. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

F. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

G. Promptly enter changes in Project Record Documents.

1.06 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:
1. All closeout procedures specified in Section 01 7000.
2. Completion of items specified for completion after Substantial Completion (punchlists).
3. Assurance that unsettled claims will be settled.
4. Assurance that Work not complete and accepted will be completed without undue delay..
5. Transmittal of required construction records to Owner.
6. Proof taxes, fees, and similar obligations have been paid.
7. Removal of temporary facilities and services.
8. Removal of surplus materials, rubbish, and similar elements.
9. HUD Certified payrolls and all required CDBG-DR documentation for Davis Bacon wage rates.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 2100 - ALLOWANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cash and material allowances.

B. Payment and modification procedures relating to allowances.

1.02 RELATED REQUIREMENTS

A. Section 01 2000 - Price and Payment Procedures: Additional payment and modification procedures.

1.03 CASH AND MATERIAL ALLOWANCES

A. Costs Included in Allowances: Cost of product to Contractor or subcontractor, less applicable trade discounts.

B. Architect Responsibilities:
   1. Consult with Contractor for consideration and selection of products, suppliers, and installers.
   2. Select products in consultation with Owner and transmit decision to Contractor.
   3. Prepare Change Order.

C. Contractor Responsibilities:
   1. Assist Architect in selection of products, suppliers, and installers.
   2. Obtain proposals from suppliers and installers and offer recommendations.
   3. On notification of which products have been selected, execute purchase agreement with designated supplier and installer.
   4. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
   5. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.

D. Differences in costs will be adjusted by Change Order.

1.04 ALLOWANCES SCHEDULE

A. Section 32 9219 - Seeding & 32 9300 - Plants: Include the stipulated sum of $25,000 for purchase and delivery and installation of Landscaping.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 2300 - ALTERNATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Description of Alternates.

B. Procedures for pricing Alternates.

C. Documentation of changes to Contract Sum and Contract Time.

1.02 DEFINITIONS

A. Alternate: An alternate is an amount proposed by Bidders and stated on the Bid Form for certain construction activities defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1.03 ACCEPTANCE OF Alternates

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.

B. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

C. Work Included Under Each Alternate: Make modifications to work required by each alternate selected at no additional cost to the Owner other than as proposed on the Bid Form. Bidders shall be responsible for alternates and shall see that all changes are covered under their related sections, whether specifically called out or not. Extra costs incurred due to modifications to or deviations from the Drawings or Specifications caused directly or indirectly by each alternate shall be included in each alternate bid.

1.04 SCHEDULE OF Alternates

A. Alternate No. 1: Exterior Wall Insulation.
   1. State the amount to be ADDED to the Base Bid to provide all materials, labor & equipment required for addition of exterior wall insulation, as indicated in the drawings and specifications.

B. Alternate No. 2: Exterior Curtainwall/Storefront Replacement.
   1. State the amount to be ADDED to the Base Bid to provide all materials, labor & equipment required for replacing the exterior curtainwall and storefront, as indicated in the drawings and specifications.

C. Alternate No. 3: Exterior Entrance Improvements.
   1. State the amount to be ADDED to the Base Bid to provide all materials, labor & equipment required for improvements to the exterior entrance, as indicated in the drawings and specifications.

D. Alternate No. 4: Increased Glazing.
   1. State the amount to be ADDED to the Base Bid to provide all materials, labor & equipment required for the increased 3rd Floor glazing, as indicated in the drawings and specifications.

E. Alternate No. 5: Operable Glass Partition at Council Chambers.
   1. State the amount to be ADDED to the Base Bid to provide all materials, labor & equipment required for the addition of an operable glass partition at Council Chambers, as indicated in the drawings and specifications.

F. Alternate No. 6: HVAC Air Purification System.
   1. State the amount to be ADDED to the Base Bid to provide all materials, labor & equipment required for a HVAC Air Purification System, as indicated in the drawings and specifications.

G. Alternate No. 7: Supergraphics.
   1. State the amount to be ADDED to the Base Bid to provide all materials, labor & equipment required for the addition of Supergraphics, as indicated in the drawings and specifications.

H. Alternate No. 8: Replace Cooling Tower.
   1. State the amount to be ADDED to the Base Bid to provide all materials, labor & equipment required for replacement of the cooling tower, as indicated in the drawings and specifications.

I. Alternate No. 9: Parking Lot Mill/Overlay.
   1. State the amount to be ADDED to the Base Bid to provide all materials, labor & equipment required for addition of parking lot mill and overlay, as indicated in the drawings and specifications.

J. Alternate No. 10: Replace Exterior Parking Lot Lighting.
   1. State the amount to be ADDED to the Base Bid to provide all materials, labor & equipment required for replacement of exterior parking lot lighting, as indicated in the drawings and specifications.

K. Alternate No. 11: Exterior Precast Acid Cleaning.
   1. State the amount to be ADDED to the Base Bid to provide all materials, labor & equipment required for the addition of existing exterior precast acid cleaning, as indicated in the drawings and specifications.

L. Alternate No. 12: Roofing.
   1. State the amount to be ADDED to the Base Bid to provide all materials, labor & equipment required for the addition of roofing, as indicated in the drawings and specifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 3000 - ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General administrative requirements.

B. Electronic document submittal service.

C. Preconstruction meeting.

D. Site mobilization meeting.

E. Progress meetings.

F. Submittals for review, information, and project closeout.

G. Number of copies of submittals.

H. Requests for Information (RFI) procedures.

I. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Section 01 6000 - Product Requirements: General product requirements.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
   1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Information (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
   2. Contractor and Architect are required to use this service.
   3. It is Contractor's responsibility to submit documents in allowable format.
   4. Subcontractors, suppliers, and Architect's consultants are to be permitted to use the service at no extra charge.
   5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
   6. Paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.

7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

B. Cost: The cost of the service is to be paid by Contractor; include the cost of the service in the Contract Sum.

C. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Architect and Contractor participating; further training is the responsibility of the user of the service.

D. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for Owner.

3.02 PRECONSTRUCTION MEETING

A. Schedule and administer a preconstruction meeting after Notice of Award.

B. Attendance Required:
1. Owner.
2. Architect.
3. Contractor.
4. Major subcontractors.

C. Agenda:
1. Execution of Owner-Contractor Agreement.
2. Submission of executed bonds and insurance certificates.
3. Distribution of Contract Documents.
4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
5. Designation of personnel representing the parties to Contract and Architect.
6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
7. Scheduling.
    a. Contractor's schedule.
    b. Start of on-site work.
    c. Completion date.
    d. Coordination with on-site Owner's representatives.
    e. Sequence of work.
    f. Full or partial Owner occupancy as applicable.
8. Shop drawings and sample distribution.
9. Mockups.
10. Critical products for the project timeline.
11. Material deliveries.
12. Procedures to be followed when working on site.
13. Address items prior to on-site work.
    a. Parking.
    b. Security.
    c. Temporary Facilities including heat, electricity and water.
    d. Noise and general safety.
    e. Site fencing.
    f. Use of the site.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.03 SITE MOBILIZATION MEETING

A. Schedule and administer a site mobilization meeting.

B. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Architect.
   4. Contractor's superintendent.
   5. Major subcontractors.

C. Agenda:
   1. Use of premises by Owner and Contractor.
   2. Owner's requirements.
   3. Construction facilities and controls provided by Owner.
   4. Temporary utilities provided by Owner.
   5. Survey and building layout.
   6. Security and housekeeping procedures.
   7. Schedules.
   8. Application for payment procedures.
   9. Procedures for testing.
   10. Procedures for maintaining record documents.
   11. Requirements for start-up of equipment.
   12. Inspection and acceptance of equipment put into service during construction period.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the work at maximum monthly intervals.

B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Architect.
   4. Contractor's superintendent.
   5. Major subcontractors.

D. Agenda:
   1. Review minutes of previous meetings.
   2. Review of work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Review of off-site fabrication and delivery schedules.
   7. Maintenance of progress schedule.

8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Coordination of projected progress.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on progress schedule and coordination.
13. Other business relating to work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.05 CLOSEOUT MEETING

A. Schedule and administer meetings throughout progress of the work at maximum monthly intervals.

B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required:
1. Contractor.
2. Owner.
3. Architect.
4. Applicable subcontractors.

D. Agenda:
1. Starting Systems and Owner Training.
    a. Mechanical.
    b. Electrical.
    c. Specialty Systems, i.e. Elevator.
    d. Testing, adjusting and balancing.
    e. Startup logs.
2. Project Record Drawings.
3. Record Project Manuals.
4. Project Record Submittals.
5. Warranties and Special Warranties.
6. Spare parts, extra stock materials.
7. Contractors initial punchlist.
8. Architects review of punchlist.
9. Certificate of Occupancy.
    a. Partial Occupancy.
    b. Temporary Occupancy.
10. Consent of Surety of Final Payment.
11. Final Payment and Retainage Reduction.
12. Affidavit of Liens and Waivers.
13. Insurance Coverages.
    a. Property.
    b. Liability.
14. 11 Month Warranty Walkthrough to identify deficiencies to be addressed prior to expiration of the 12 month warranty.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.06 REQUESTS FOR INTERPRETATION (RFI)

A. Definition: A request seeking one of the following:
   1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
   2. A resolution to an issue which has arisen due to field conditions and affects design intent.

B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.

C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
   1. Prepare a separate RFI for each specific item.
      a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
      b. Do not forward requests which solely require internal coordination between subcontractors.
   2. Prepare in a format and with content acceptable to Owner.
   3. Prepare using software provided by the Electronic Document Submittal Service.
   4. Combine RFI and its attachments into a single electronic file. PDF format is preferred.

D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
   1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
   2. Unacceptable Uses for RFIs: Do not use RFIs to request the following::
      a. Approval of submittals (use procedures specified elsewhere in this section).
      b. Approval of substitutions (see Section - 01 6000 - Product Requirements)
      c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
      d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).
   3. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
   4. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
      a. The Owner reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Architect, and any of its consultants, due to processing of such RFIs.

E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
   1. Official Project name and number, and any additional required identifiers established in Contract Documents.
   2. Owner's, Architect's, and Contractor's names.
   3. Discrete and consecutive RFI number, and descriptive subject/title.
   4. Issue date, and requested reply date.

5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.

F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
1. Indicate current status of every RFI. Update log promptly and on a regular basis.
2. Note dates of when each request is made, and when a response is received.
3. Highlight items requiring priority or expedited response.
4. Highlight items for which a timely response has not been received to date.
5. Identify and include improper or frivolous RFIs.

H. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
1. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
2. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.

3.07 SUBMITTAL SCHEDULE

A. Submit to Architect for review a schedule for submittals in tabular format.
1. Coordinate with Contractor's construction schedule and schedule of values.
2. Format schedule to allow tracking of status of submittals throughout duration of construction.
3. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
4. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

3.08 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
1. Product data.
2. Shop drawings.
3. Samples for selection.
4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

3.09 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner.

3.10 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 7800 - Closeout Submittals:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Bonds.
   5. Other types as indicated.

D. Submit for Owner's benefit during and after project completion.

3.11 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

3.12 SUBMITTAL PROCEDURES

A. General Requirements:
   1. Use a separate transmittal for each item.
   2. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.

3. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
    a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
4. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
5. Schedule submittals to expedite the Project, and coordinate submission of related items.
    a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
    b. For sequential reviews involving Architect's consultants, Owner, or another affected party, allow an additional 7 days.
    c. Color selections will not be reviewed or approved until all related products are submitted to ensure a cohesive palette.
    d. Products that make up a system, assembly, or that are directly related to each other often must be reviewed together. Review will not begin until all components are submitted.
    e. Coordinate with Architect and/or Construction Manager, as applicable, where schedule dictates an expedited review of products.
6. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
7. Provide space for Contractor and Architect review stamps.
8. When revised for resubmission, identify all changes made since previous submission.
9. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
10. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.

B. Product Data Procedures:
1. Submit only information required by individual specification sections.
2. Collect required information into a single submittal.
3. Do not submit (Material) Safety Data Sheets for materials or products.

C. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
2. Do not reproduce Contract Documents to create shop drawings.
3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

D. Samples Procedures:
1. Transmit related items together as single package.
2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.

E. Do not use shop drawings without an appropriate final stamp indicating action taken in connection with construction.

3.13 SUBMITTAL REVIEW

A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.

B. Submittals for Information: Architect will acknowledge receipt and review.

C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.

END OF SECTION

SECTION 01 3216 - CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preliminary schedule.

B. Construction progress schedule, bar chart type.

1.02 SUBMITTALS

A. Within 10 days after date of Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

B. Submit updated schedule with each Application for Payment.

1.03 SCHEDULE FORMAT

A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.

B. Diagram Sheet Size: Maximum 22 x 17 inches (560 x 432 mm) or width required.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE

A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.02 CONTENT

A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

B. Identify each item by specification section number.

C. Identify work of separate stages and other logically grouped activities.

D. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.

E. Provide legend for symbols and abbreviations used.

3.03 BAR CHARTS

A. Include a separate bar for each major portion of Work or operation.

B. Identify the first work day of each week.

3.04 REVIEW AND EVALUATION OF SCHEDULE

A. Participate in joint review and evaluation of schedule with Architect at each submittal.

B. Evaluate project status to determine work behind schedule and work ahead of schedule.

C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.05 UPDATING SCHEDULE

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity.

C. Annotate diagrams to graphically depict current status of Work.

D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

E. Indicate changes required to maintain Date of Substantial Completion.

F. Submit reports required to support recommended changes.

3.06 DISTRIBUTION OF SCHEDULE

A. Distribute copies of updated schedules to Contractor's project site file, to subcontractors, suppliers, Architect, Owner, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

END OF SECTION

SECTION 01 4000 - QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.

B. References and standards.

C. Testing and inspection agencies and services.

D. Control of installation.

E. Tolerances.

F. Manufacturers' field services.

G. Defect Assessment.

1.02 RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Submittal procedures.

B. Section 01 4533 - Code-Required Special Inspections and Procedures.

C. Section 01 6000 - Product Requirements: Requirements for material and product quality.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.

C. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of inspector.
      d. Date and time of sampling or inspection.
      e. Identification of product and specifications section.
      f. Location in the Project.
      g. Type of test/inspection.
      h. Date of test/inspection.
      i. Results of test/inspection.
      j. Compliance with Contract Documents.
      k. When requested by Architect, provide interpretation of results.
   2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.

D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
   1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
   2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

F. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
   1. Submit report in duplicate within 30 days of observation to Architect for information.
   2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

G. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.
   1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

1.04 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.05 Testing and Inspection Agencies and Services

A. Owner will employ and pay for services of an independent testing agency to perform other specified testing.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

3.03 TESTING AND INSPECTION

A. See individual specification sections for testing and inspection required.

B. Testing Agency Duties:
   1. Test samples of mixes submitted by Contractor.
   2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   3. Perform specified sampling and testing of products in accordance with specified standards.
   4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   5. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
   6. Perform additional tests and inspections required by Architect.
   7. Attend preconstruction meetings and progress meetings.
   8. Submit reports of all tests/inspections specified.
   9. Submit a written report in binder form with an index at the conclusion of the work required by the Testing Agency. The report shall be submitted as a permanent record to the Owner, through the Structural Engineer, of all tests, logs, comments and written reports.

C. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.

D. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
      c. To facilitate tests/inspections.
      d. To provide delivery of samples to testing laboratories.
      e. To provide storage and curing of test samples.
   4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
   5. Each Prime Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities.
   6. Each Prime Contractor and each agency engaged to perform inspections, tests, and similar services shall coordinate the sequence of activities to accommodate required services with minimal delay.
   7. Each Prime Contractor and each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
   8. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
   9. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

E. Re-testing: The Contractor is responsible for re-testing where results of required inspections, tests, or similar services prove unsatisfactory or do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility.

F. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

G. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

H. The Contractor shall cooperate with agencies performing required inspections, tests, and similar services and provide reasonable auxiliary services as requested. Nofity the agency sufficiently in advance of operations to permit assignment of personnel.

3.04 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.

B. Submit qualifications of observer to Architect 30 days in advance of required observations.
   1. Observer subject to approval of Architect.
   2. Observer subject to approval of Owner.

C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.05 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not complying with specified requirements.

B. If, in the opinion of Architect, it is not practical to remove and replace the work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01 4533 - CODE-REQUIRED SPECIAL INSPECTIONS AND PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Code-required special inspections.

B. Testing services incidental to special inspections.

C. Submittals.

D. Manufacturers' field services.

E. Fabricators' field services.

1.02 RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Submittal procedures.

B. Section 01 4000 - Quality Requirements.

C. Section 01 6000 - Product Requirements: Requirements for material and product quality.

1.03 DEFINITIONS

A. Code or Building Code: ICC (IBC), International Building Code, Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements and specifically, Chapter 17 - Special Inspections and Tests.

B. Authority Having Jurisdiction (AHJ): Agency or individual officially empowered to enforce the building, fire and life safety code requirements of the permitting jurisdiction in which the Project is located.

C. Special Inspection:
   1. Special inspections are inspections and testing of materials, installation, fabrication, erection or placement of components and connections mandated by the AHJ that also require special expertise to ensure compliance with the approved Contract Documents and the referenced standards.
   2. Special inspections are separate from and independent of tests and inspections conducted by Owner or Contractor for the purposes of quality assurance and contract administration.

1.04 REFERENCE STANDARDS

A. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2014 (Errata 2017).

B. AISC 360 - Specification for Structural Steel Buildings; 2016.

C. ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement; 2016.

D. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field; 2017.

E. ASTM C172/C172M - Standard Practice for Sampling Freshly Mixed Concrete; 2014a.

F. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2012a.

G. AWS D1.4/D1.4M - Structural Welding Code - Reinforcing Steel; 2011.

H. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2017.

I. IAS AC291 - Accreditation Criteria for Special Inspection Agencies; 2017.

J. ICC (IBC) - International Building Code; 2018.

K. SDI (QA/QC) - Standard for Quality Control and Quality Assurance for Installation of Steel Deck; 2017.

L. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2016.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Special Inspection Agency Qualifications: Prior to the start of work, the Special Inspection Agency is required to:
   1. Submit agency name, address, and telephone number, names of full time registered Engineer and responsible officer.
   2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
   3. Submit certification that Special Inspection Agency is acceptable to AHJ.
   4. Submit documentation that Special Inspection Agency is accredited by IAS according to IAS AC291.

C. Testing Agency Qualifications: Prior to the start of work, the Testing Agency is required to:
   1. Submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
   2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
   3. Submit certification that Testing Agency is acceptable to AHJ.
   4. Submit documentation that Testing Agency is accredited by IAS according to IAS AC89.

D. Special Inspection Reports: After each special inspection, Special Inspector is required to promptly submit at least two copies of report; one to Architect and one to the AHJ.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of Special Inspector.
      d. Date and time of special inspection.
      e. Identification of product and specifications section.
      f. Location in the Project.
      g. Type of special inspection.
      h. Date of special inspection.
      i. Results of special inspection.
      j. Compliance with Contract Documents.

2. Final Special Inspection Report: Document special inspections and correction of discrepancies prior to the start of the work.

E. Test Reports: After each test or inspection, promptly submit at least two copies of report; one to Architect and one to AHJ.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of inspector.
      d. Date and time of sampling or inspection.
      e. Identification of product and specifications section.
      f. Location in the Project.
      g. Type of test or inspection.
      h. Date of test or inspection.
      i. Results of test or inspection.
      j. Compliance with Contract Documents.

F. Certificates: When specified in individual special inspection requirements, Special Inspector shall submit certification by the manufacturer, fabricator, and installation subcontractor to Architect and AHJ, in quantities specified for Product Data.
   1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
   2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect and AHJ.

G. Manufacturer's Field Reports: Submit reports to Architect and AHJ.
   1. Submit report in duplicate within 30 days of observation to Architect for information.
   2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in Contract Documents.

H. Fabricator's Field Reports: Submit reports to Architect and AHJ.
   1. Submit report in duplicate within 30 days of observation to Architect for information.
   2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in Contract Documents.

1.06 SPECIAL INSPECTION AGENCY

A. Owner will employ services of a Special Inspection Agency to perform inspections and associated testing and sampling in accordance with ASTM E329 and required by the building code.

B. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.07 TESTING AND INSPECTION AGENCIES

A. Owner may employ services of an independent testing agency to perform additional testing and sampling associated with special inspections but not required by the building code.

B. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.08 QUALITY ASSURANCE

A. Special Inspection Agency Qualifications:
   1. Independent firm specializing in performing testing and inspections of the type specified in this section.

B. Testing Agency Qualifications:
   1. Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 SCHEDULE OF SPECIAL INSPECTIONS, GENERAL

A. Frequency of Special Inspections: Special Inspections are indicated as continuous or periodic.
   1. Continuous Special Inspection: Special Inspection Agency is required to be present in the area where the work is being performed and observe the work at all times the work is in progress.
   2. Periodic Special Inspection: Special Inspection Agency is required to be present in the area where work is being performed and observe the work part-time or intermittently and at the completion of the work.

3.02 SPECIAL INSPECTIONS FOR STEEL CONSTRUCTION

A. Structural Steel: Comply with quality assurance inspection requirements of ICC (IBC).

B. Cold-Formed Steel Deck: Comply with quality assurance inspection requirements of SDI (QA/QC).

3.03 SPECIAL INSPECTIONS FOR CONCRETE CONSTRUCTION

A. Reinforcemen and Verification of Placement: Verify compliance with ACI 318, Chapters 20, 25.2, 25.3, 26.6.1-26.6.3; periodic.

B. Reinforcing Bar Welding: Verify compliance with AWS D1.4/D1.4M and ACI 318, 26.6.4; periodic.
   1. Verify weldability of reinforcing bars other than those complying with ASTM A706/A706M; periodic.
   2. Inspect single-pass fillet welds, maximum 5/16 inch; periodic.
   3. Inspect all other welds; continuous.

C. Bolts Installed in Concrete: Where allowable loads have been increased or where strength design is used, verify compliance with approved Contract Documents and ACI 318, Sections 8.1.3 and 21.2.8 prior to and during placement of concrete; continuous.

D. Anchors Post-Installed in Hardened Concrete: Verify compliance with ACI 318.
   1. Adhesive Anchors: Verify horizontally or upwardly-inclined orientation installations resisting sustained tension loads - Section 17.8.2.4; continuous.
   2. Other Mechanical and Adhesive Anchors: Verify as per Chapter 17.8.2; periodic.

E. Design Mix: Verify plastic concrete complies with the design mix in approved Contract Documents and with ACI 318, Chapter 19, 16.4.3, 26.4.4; periodic.

F. Concrete Sampling Concurrent with Strength Test Sampling: Each time fresh concrete is sampled for strength tests, verify compliance with ASTM C172/C172M, ASTM C31/C31M and ACI 318, Chapter 26.5, 26.12, and record the following, continuous:
   1. Slump.
   2. Air content.
   3. Temperature of concrete.

G. Concrete and Shotcrete Placement: Verify application techniques comply with approved Contract Documents and ACI 318, Chapter 26.5; continuous.

H. Specified Curing Temperature and Techniques: Verify compliance with ACI 318, Chapter 26.5.3-26.5.5; periodic.

I. Concrete Strength in Situ: Verify concrete strength complies with approved Contract Documents and ACI 318, Chapter 26.11.2, for the following:
   1. Beams and structural slabs, prior to removal of shores and forms; periodic.

J. Formwork Shape, Location and Dimensions: Verify compliance with approved Contract Documents and ACI 318, Chapter 26.11.1.2(b); periodic.

K. Materials: If the Contractor cannot provide sufficient data or documentary evidence that concrete materials comply with the quality standards of ACI 318, the AHJ will require testing of materials in accordance with the appropriate standards and criteria in ACI 318, Chapters 19 and 20.

3.04 SPECIAL INSPECTIONS FOR MASONRY CONSTRUCTION

A. Engineered Masonry in Buildings Designated as "Essential Facilities": Verify compliance of each item below with approved Contract Documents and the applicable articles of TMS 402/602.
   1. Inspections and Approvals:
      a. Verify compliance with the required inspection provisions of the approved Contract Documents; periodic.
      b. Verify approval of submittals required by Contract Documents; periodic.
   2. Compressive Strength of Masonry: Verify compressive strength of masonry units prior to start of construction and upon completion of each 5,000 square feet (464.5 sq m) increment of masonry erected during construction; periodic.
   3. Preblended Mortar and Grout: Verify proportions of materials upon delivery to site; periodic.
   4. Slump Flow and Visual Stability Index (VSI): Verify compliance as self consolidating grout arrives on site; continuous.
   5. Engineered Elements, Joints, Anchors, Grouting, Protection: Verify compliance of each item below with approved Contract Documents and referenced standards.
      a. Proportions of site prepared mortar; periodic.
      b. Placement of masonry units and construction of mortar joints; periodic.
      c. Placement of reinforcement, connectors, prestressing tendons, anchorages, etc.; periodic.
      d. Size and location of structural elements; periodic.
      e. Type, size and location of anchors, including anchorage of masonry to structural members, frames or other construction; continuous.
      f. Size, grade and type of reinforcement, anchor bolts and prestressing tendons and anchorages; periodic.
      g. Welding of reinforcing bars; continuous.
   6. Preparation of Grout Specimens, Mortar Specimens and Prisms: Observe preparation of specimens; continuous.

3.05 SPECIAL INSPECTIONS FOR SOILS

A. Materials and Placement: Verify each item below complies with approved construction documents and approved geotechnical report.
   1. Design bearing capacity of material below shallow foundations; periodic.
   2. Design depth of excavations and suitability of material at bottom of excavations; periodic.
   3. Materials, densities, lift thicknesses; placement and compaction of backfill: continuous.
   4. Subgrade, prior to placement of compacted fill verify proper preparation; periodic.

B. Testing: Classify and test excavated material; periodic.

3.06 SPECIAL INSPECTIONS FOR HELICAL PILE FOUNDATIONS

A. Materials, Equipment and Placement: Verify each item below complies with approved construction documents and approved geotechnical report.
   1. Type and capacity of installation equipment used; continuous.
   2. Pile dimensions; continuous.
   3. Tip elevation; continuous.
   4. Final depth; continuous.
   5. Final installation torque; continuous.
   6. Other installation data requested in writing by Architect; continuous.

3.07 OTHER SPECIAL INSPECTIONS

A. Provide for special inspection of work that, in the opinion of the AHJ, is unusual in nature.

B. For the purposes of this section, work unusual in nature includes, but is not limited to:
   1. Construction materials and systems that are alternatives to materials and systems prescribed by the building code.
   2. Unusual design applications of materials described in the building code.
   3. Materials and systems required to be installed in accordance with the manufacturer's instructions when said instructions prescribe requirements not included in the building code or in standards referenced by the building code.

C. Alternative Test Procedures: Where approved rules and standards do not exist, test materials and assemblies as required by AHJ or provide AHJ with documentation of quality and manner in which those materials and assemblies are used.

3.08 SPECIAL INSPECTION AGENCY DUTIES AND RESPONSIBILITIES

A. Special Inspection Agency shall:
   1. Verify samples submitted by Contractor comply with the referenced standards and the approved Contract Documents.
   2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   3. Perform specified sampling and testing of products in accordance with specified reference standards.
   4. Ascertain compliance of materials and products with requirements of Contract Documents.
   5. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
   6. Perform additional tests and inspections required by Architect.
   7. Attend preconstruction meetings and progress meetings.

8. Submit reports of all tests or inspections specified.

B. Limits on Special Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the work.

C. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

D. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.09 TESTING AGENCY DUTIES AND RESPONSIBILITIES

A. Testing Agency Duties:
   1. Test samples submitted by Contractor.
   2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   3. Perform specified sampling and testing of products in accordance with specified standards.
   4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   5. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
   6. Perform additional tests and inspections required by Architect.
   7. Attend preconstruction meetings and progress meetings.
   8. Submit reports of all tests or inspections specified.

B. Limits on Testing or Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the work.

C. On instructions by Architect, perform re-testing required because of non-compliance with specified requirements, using the same agency.

D. Contractor will pay for re-testing required because of non-compliance with specified requirements.

3.10 CONTRACTOR DUTIES AND RESPONSIBILITIES

A. Contractor Responsibilities, General:
   1. Deliver to agency at designated location, adequate samples of materials for special inspections that require material verification.
   2. Cooperate with agency and laboratory personnel; provide access to approved documents at project site, to the work, to manufacturers' facilities, and to fabricators' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to work to be tested or inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested or inspected.
      c. To facilitate tests or inspections.
      d. To provide storage and curing of test samples.
   4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing or inspection services.

5. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

3.11 MANUFACTURERS' AND FABRICATORS' FIELD SERVICES

A. When specified in individual specification sections, require material suppliers, assembly fabricators, or product manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, to test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.

B. Submit qualifications of observer to Architect 30 days in advance of required observations.
   1. Observer subject to approval of Architect.
   2. Observer subject to approval of Owner.

C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

END OF SECTION

SECTION 01 5000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary telecommunications services.

B. Temporary sanitary facilities.

C. Temporary Controls: Barriers, enclosures, and fencing.

D. Waste removal facilities and services.

1.02 RELATED REQUIREMENTS

A. Section 01 5813 - Temporary Project Signage.

1.03 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

B. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).

1.04 QUALITY ASSURANCE

A. Regulations: All contractors, sub-contractors, and suppliers shall comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to:
   1. Building code requirements.
   2. Health and safety regulations.
   3. Utility company regulations.
   4. Police Department, Fire Department, and Rescue Squad rules.
   5. Environmental protection regulations.
      a. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

B. Standards: All contractors, sub-contractors, and suppliers shall comply with NFPA Code 241, "Building Construction and Demolition Operations," ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition," and NECA Electrical Design Library "Temporary Electrical Facilities."

C. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services," prepared by AGC and ASC for industry recommendations.

D. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with the normal application of trade regulations and union jurisdictions.

E. All contractors, sub-contractors, and suppliers shall provide new materials; if acceptable to the Architect, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.

F. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

G. Lumber and Plywood: Comply with requirements in Section 06 1000 - Rough Carpentry.

H. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electrical service. Install service in compliance with the National Electrical Code (NFPA 70).

I. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures, construction operations, and similar elements.

J. Protection: Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

1.05 DIVISION OF RESPONSIBILITIES

A. Each Prime Contractor is responsible for specific temporary services and facilities used by other Prime Contractors, and other entities on site. The General Contractor is responsible for providing temporary services and facilities that are not normal to the construction activities of other Prime Contractors, and are not specifically assigned otherwise by the Architect.

B. Each prime Contractor shall provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed

C. Each prime Contractor shall prepare a schedule indicating dates for the implementation and termination of each temporary utility for which it is responsible.

D. At the earliest feasible time, when acceptable to the Owner, change over from the use of the temporary service to use of the permanent service.

E. Temporary use of permanent facilities: The Installer of each permanent service or facility shall assume responsibility for its operation, maintenance, and protection during its use as a construction service or facility prior to the Owner's acceptance, regardless of previously assigned responsibilities.
   1. Other entities using temporary services and facilities include, but are not limited to:
      a. Other non-prime contractors.
      b. The Owner's workforces.
      c. Occupants of the Project.
      d. The Architect.
      e. Testing Agencies.

F. Each prime Contractor is responsible for:
   1. Installation, operation, maintenance, and removal of each temporary service or facility usually considered as its own normal construction activity, as well as the costs and use charges associated with each such service or facility.
   2. Plug-in electric power cords and extension cords, and supplementary plug-in task lighting and special lighting necessary exclusively for its own activities.
   3. Their own field office, complete with necessary furniture, utilities and telephone service.
   4. Their own storage and fabrication shed as required.

5. Temporary heat, ventilation, humidity control, and enclosure of the building where these utilities are necessary for its construction activity, but where these utilities have not yet been installed by the responsible prime Contractor.
6. Collection and disposal of its own hazardous, dangerous, unsanitary, or other harmful waste material.
7. Recycling of waste materials.
8. Each major trade working on the site shall provide one man for two hours per week for cleanup of the building and site, to be coordinated by the General Contractor. The General Contractor shall provide sweeping compound and other clean-up materials.
9. Secure lockup of their own tools, materials, and equipment.
10. Construction aids and miscellaneous services and facilities necessary exclusively for their own construction activities.
11. Environmental protection.

G. The Contractor for General Construction is responsible for:
1. Temporary field office for construction progress meetings.
2. Temporary roads and road maintenance including snow removal.
3. Site snow removal.
4. Temporary portable toilets, including disposable supplies.
5. Temporary wash facilities, including disposable supplies.
6. Temporary enclosure of the building.
7. Temporary portable fire extinguishers.
8. General collection and disposal of wastes.
9. Barricades, warning signs and lights.
10. Enclosure fence.
11. Security enclosure and lockup.
12. Providing protection of existing windows, doors, walls, floors, ceilings, and other existing building features from construction related damage by means of enclosures, chutes, plywood, mats, and/or coverings as deemed necessary by Owner.
13. Grading of site to channel standing water to storm sewer facilities.
14. Pumping of standing water from the site.
15. Dewatering of excavations.
16. Temporary sewers and drainage.
17. Fuel costs for temporary heat.

H. The Mechanical Contractor is responsible for setup, operation, maintenance, and removal of equipment and fixtures required to provide the following temporary facilities as required in this specification:
1. Temporary heat, ventilation, and humidity control.
2. Temporary water service.
3. Temporary gas service.

I. The Electrical Contractor is responsible for setup, operation, maintenance, and removal of:
1. Temporary electrical service and distribution.
2. Temporary lighting.
3. Electrical power connection to temporary heating, ventilation, and other equipment provided by other contractors.

1.06 TEMPORARY UTILITIES

A. Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the company's recommendations.

B. Arrange with the company and existing users for a time when service can be interrupted, where necessary, to make connections for temporary services.

C. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.

D. Obtain easements to bring utilities to the site, where the Owner's easements cannot be used for that purpose.

E. Cost or use charges for temporary facilities are not chargeable to the Owner or Architect; Prime Contractor's cost or use charges for temporary services or facilities will not be accepted as a basis of claim for an adjustment in the Contract Sum or Contract Time.

F. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

G. Dewatering Facilities and Drains: For temporary drainage and dewatering facilities and operations not directly associated with construction activities included under individual Sections, comply with dewatering requirements of applicable Sitework Divisions and Sections. Where feasible, utilize the same facilities. Maintain the site, excavations, and construction free of water.

H. Water: Provide potable water approved by local health authorities.
   1. Water service and distribution: Install water service and distribution piping of sizes and pressures adequate for construction until permanent water service is in use.
   2. Sterilization: Sterilize temporary water piping prior to use.
   3. Water supply may only be interrupted on a weekend for changing over to the new service.

I. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds, and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off the site in a lawful manner.
   1. Connect temporary sewers to the municipal system as directed by the sewer department officials.
   2. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. Following heavy use, restore normal conditions promptly.
   3. Filter out excessive amounts of soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.
   4. Temporary holding tanks and pumps will be required for both storm and sanitary sewer where existing services exit the present building in to the construction zone.

J. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the type of fuel being consumed.

K. Temporary Heat:
   1. Provide temporary heat required by construction activities, for curing or drying of completed installations, or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.
   2. Temporary heat shall not be directly fired into the space, or have exhaust gases discharged into the tempered space. The contractor providing temporary heating facilities shall be responsible for

complying with all workplace health requirements. Use of gasoline-burning space heaters, or open burning or salamander type heating units is prohibited.

L. Heating Facilities: Provide properly vented self-contained LP gas or fuel oil heaters with individual space thermostatic control. Combustion gases shall be vented to the exterior. The permanent system shall not be used for temporary heat.

M. Temporary Electric Power:
   1. Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction. Include meters, transformers, overload protected disconnects, automatic ground-fault interrupters, and main distribution switch gear.
   2. Power panels shall be 100A, 120/240V loadcenter or panelboards with NEMA AB1 type molded case circuit breakers. Panelboards shall be provided for use by all trades. Receptacles shall be equivalent to those specified in Division 26 Sections. Provide properly configured NEMA polarized outlets to prevent insertion of 125 volt AC plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment. Power receptacles shall include three duplex 20A, 125V, single phase, and one 50A 125/250V, single phase located on a plywood backboard with the temporary panel. Receptacles shall be provided at intervals and locations as required for legal use of extension cords.

N. Temporary Electric Lights:
   1. Whenever an overhead floor or roof deck has been installed, install temporary lighting with local switching.
   2. Install and operate temporary lighting that will fulfill security and protection requirements, without operating the entire lighting system, and will provide adequate illumination for construction operations and traffic conditions.
   3. Contractor shall provide and maintain the equivalent illumination of one 100 watt incandescent fixture per 150 square feet of space (minimum one), as strings of lighting with guards, the full length of each corridor or interior construction route, and floodlighting for all exterior excavation areas. Every other stringer fixture and floodlighting shall be circuited and controlled by circuit breakers located in temporary power panels.
   4. Lamps and Light Fixtures: Provide rough service lamps. Provide guard cages or tempered glass enclosures. Provide weatherproof quartz exterior fixtures.
   5. Under no conditions shall the permanent lighting fixtures be used for temporary lighting, unless approved in writing obtained from the Architect/Engineer upon consultation with the Owner.

1.07 TELECOMMUNICATIONS SERVICES

A. Each Contractor is responsible for their own cellular phone service.

B. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.

1.08 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

B. Maintain daily in clean and sanitary condition.

C. Sanitary facilities include temporary toilets, wash facilities and drinking water fixtures. Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Projects's needs.

D. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility.

1.09 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.

C. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public, of the hazard being protected against. Where appropriate and needed provide lighting, including flashing red or amber lights.

D. Provide protection for plants designated to remain. Replace damaged plants.

E. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.10 FENCING

A. Site Fencing:
   1. Construction: Commercial grade chain link fence.
   2. Provide 6 foot (1.8 m) high fence around construction site; equip with vehicular and pedestrian gates with locks.

B. Tree Protection Fencing
   1. Provide 4 foot high orange polypropylene fencing located at the canopy line / drip line of trees on the site to protect trunks from damage and soil compaction around the root area.
   2. Posts are contractor's option

C. Maintain the fences in good secure condition for the project's duration until agreement with the Owner and Architect that it may be removed.

1.11 EXTERIOR ENCLOSURES

A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

B. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hours a day basis where required to achieve indicated results and to avoid possibility of damage.

1.12 INTERIOR ENCLOSURES

A. Provide temporary partitions and ceilings as indicated to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.

B. Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:
   1. Insulated to R 12 (RSI 2.1).
   2. STC rating of 35 in accordance with ASTM E90.
   3. Maximum flame spread rating of 25 in accordance with ASTM E84.
   4. Interior protection barriers and walls shall be constructed using 5/8" type X gypsum board each side of 3-5/8 inch minimum thickness metal stud framing.
   5. Doors between construction and occupied spaces shall be self closing, and self latching.

1.13 SECURITY AND SAFETY

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

B. Coordinate with Owner's security program.

C. First Aid Supplies: Comply with regulation of authorities having jurisdiction.

D. Temporary Fire Protection
   1. Fire Extinguishers: Provide hand-carried, portable, UL-rated, class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, class ABC dry chemical extinguishers, or a combination of extinguishers of NFPA recommended types for the exposures.
   2. Comply with NFPA 10 and 241 for classification, extinguishing agent, and size required by location and class of fire exposure.
   3. Until fire protection needs are supplied by permanent facilities, install and maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations."
   4. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.

E. Store combustible materials in containers in fire-safe locations. Remove from construction site daily.

F. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.

G. Provide continuous supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.

H. Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer as requested by the Architect.

I. Until permanent stairs are available, provide temporary stairs where ladders are not adequate. Cover finished permanent stairs with a protective covering of plywood or similar materials so finishes will be undamaged at the time of acceptance.

1.14 VEHICULAR ACCESS AND PARKING

A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.

B. Coordinate access and haul routes with governing authorities and Owner.

C. Provide and maintain access to fire hydrants, free of obstructions.

D. Provide means of removing mud from vehicle wheels before entering streets.

E. Designated existing on-site roads may be used for construction traffic.

F. Coordinate temporary parking areas to accommodate construction personnel with Owner. When site space is not adequate, provide additional off-site parking.

1.15 WASTE REMOVAL

A. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.

B. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

C. Provide containers with lids. Remove trash from site periodically.

D. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

F. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F (27 deg C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste.

1.16 PROJECT SIGNS - See Section 01 5813

1.17 FIELD OFFICES

A. Maintain field offices and support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities under conditions acceptable to the Owner.

B. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture .

C. Provide space for Project meetings, with table and chairs to accommodate 6 persons.

D. Locate offices a minimum distance of 30 feet (10 m) from existing and new structures.

1.18 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.

B. Remove underground installations to a minimum depth of 2 feet (600 mm). Grade site as indicated.

C. Clean and repair damage caused by installation or use of temporary work.

D. Termination and Removal: Unless the Architect requests it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, but no later than Substantial Completion. Complete, or if necessary restore, permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace Work which cannot be satisfactorily repaired.

E. Materials and facilities that constitute temporary facilities are property of each prime Contractor.

F. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:
   1. Replace air filters and clean inside of ductworks and housings.
   2. Replace significantly worn parts and parts that have been subject to unusual operating conditions.
   3. Replace lamps that are burned out or noticeably dimmed by substantial hours of use.

G. Restore existing facilities used during construction to original condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 5813 - TEMPORARY PROJECT SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project identification sign.

1.02 QUALITY ASSURANCE

A. Design sign and structure to withstand 50 miles/hr (80 km/hr) wind velocity.

B. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.

PART 2 PRODUCTS

2.01 SIGN MATERIALS

A. Structure and Framing: New, wood, structurally adequate.

B. Sign Surfaces: Exterior grade plywood with medium density overlay, minimum 3/4 inch (19 mm) thick, standard large sizes to minimize joints.

C. Sign Media: Sintra PVC foam board or approved equal product.

2.02 PROJECT IDENTIFICATION SIGN

A. One printed sign of construction, design, and content shown on Drawings, location designated.

B. Size: 8 feet high by 12 feet wide.

C. Graphics for the sign will be provided in electronic format by the Architect. Contractor shall have the graphic printed on the specified sign media.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install project identification sign within 30 days after date fixed by Notice to Proceed.

B. Erect at location coordinated with Architect.

C. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.

D. Install sign surface plumb and level, with butt joints. Anchor securely.

E. Paint exposed surfaces of sign, supports, and framing.

3.02 MAINTENANCE

A. Maintain signs and supports clean, repair deterioration and damage.

3.03 REMOVAL

A. Remove signs, framing, supports, and foundations at completion of Project and restore the area.

END OF SECTION

SECTION 01 6000 - PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.

B. Sustainable design-related product requirements.

C. Re-use of existing products.

D. Transportation, handling, storage and protection.

E. Product option requirements.

F. Substitution limitations.

G. Procedures for Owner-supplied products.

H. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

A. Section 00 2600 - Procurement Substitution Requirements: Requests for substitution during the bidding process.

B. Section 01 2500 - Substitution Procedures: Substitutions made during procurement and/or construction phases.

C. Section 01 4000 - Quality Requirements: Product quality monitoring.

D. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.

E. Section 01 7419 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.

1.03 DEFINITIONS

A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms are self-explanatory and have well recognized meanings in the construction industry.
   1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," " equipment," "system," and terms of similar intent.
   2. "Named Products" are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturer's published product literature, that is current as of the date of the Contract Documents.
   3. "Materials" are products that are substantially shaped, cut, worked, mixed, finished, refined, or otherwise fabricated, processed, or installed to form a part of the Work.
   4. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

1.04 REFERENCE STANDARDS

A. EN 15804 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products; 2013.

B. ISO 14025 - Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures; 2006.

C. ISO 14040 - Environmental management -- Life cycle assessment -- Principles and framework; 2006.

D. ISO 14044 - Environmental management -- Life cycle assessment -- Requirements and guidelines; 2006.

E. ISO 21930 - Sustainability in buildings and civil engineering works -- Core rules for environmental product declarations of construction products and services; 2017.

1.05 SUBMITTALS

A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
   1. Submit within 30 days after date of Agreement.
   2. For products specified only by reference standards, list applicable reference standards.

B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

E. Sustainable Design Submittals: Items necessary to document use of sustainable construction materials, products, and practices.

1.06 QUALITY ASSURANCE

A. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.

B. Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
   1. Each prime Contractor is responsible for providing products and construction methods that are compatible with products and construction methods of other prime or separate Contractors.
   2. If a dispute arises between prime Contractors over concurrently selectable, but incompatible products, the Architect will determine which products shall be retained and which are incompatible and must be replaced.

C. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to view in occupied spaces or on the exterior.

D. Labels: Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface that is not conspicuous.

E. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface which is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
   1. Name of product and manufacturer.
   2. Model and serial number.
   3. Capacity.
   4. Speed.
   5. Ratings.

F. Environmental Product Declaration (EPD): Publicly available, critically reviewed life cycle analysis having at least a cradle-to-gate scope.
   1. Good: Product-specific; compliant with ISO 14044.
   2. Better: Industry-wide, generic; compliant with ISO 21930, or with ISO 14044, ISO 14040, ISO 14025, and EN 15804; Type III third-party certification with external verification, in which the manufacturer is recognized as the program operator.
   3. Best: Commercial-product-specific; compliant with ISO 21930, or with ISO 14044, ISO 14040, ISO 14025, and EN 15804; Type III third-party certification with external verification, in which the manufacturer is recognized as the program operator.
   4. Where demonstration of impact reduction below industry average is required, submit both industry-wide and commercial-product-specific declarations; or submit at least 5 declarations for products of the same type by other manufacturers in the same industry.

G. Health Product Declarations (HPD): Complete, published declaration with full disclosure of known hazards, prepared using one of the HPDC (HPD-OLT) online tools.

H. Sustainably Harvested Wood: Solid wood, wood chips, and wood fiber certified or labeled by an organization accredited by one of the following:
   1. The Forest Stewardship Council, The Principles for Natural Forest Management; for Canada visit http://www.fsccanada.org, for the USA visit http://www.fscus.org.

PART 2 PRODUCTS

2.01 PRODUCT SELECTION

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation.
   1. Provide products complete with all accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and for the intended use and effect.
   2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

B. Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:

1. Proprietary Specification Requirements: Where only a single product or manufacturer is named, provide the product indicated. No substitutions will be permitted.
2. Semiproprietary Specification Requirements: Where two or more products or manufacturers are named, provide one of the products indicated. No substitutions will be permitted.
    a. Where products or manufacturers are specified by name, accompanied by the term "or equal," or "or approved equal" comply with the Contract Documents provisions concerning "substitutions" to obtain approval for use of an unnamed product.
3. Descriptive Specification Requirements: Where specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.
4. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. General overall performance of a product is implied where the product is specified for a specific application.
    a. Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.
5. Compliance with Standards, Codes, and Regulations: Where the Specifications only require compliance with an imposed code, standard, or regulation select a product that complies with the standards, codes, or regulations specified.
6. Visual Matching: Where Specifications require matching an established Sample, the Architect's decision will be final on whether a proposed product matches satisfactorily.
7. Visual Selection: Where specified product requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Architect will select the color, pattern, and texture from the product line selected.

2.02 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.

B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.

C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

2.03 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by Contract Documents.

B. Use of products having any of the following characteristics is not permitted:
    1. Made using or containing CFC's or HCFC's.
    2. Made of wood from newly cut old growth timber.
    3. Containing lead, cadmium, or asbestos.

C. Where other criteria are met, Contractor shall give preference to products that:
    1. If used on interior, have lower emissions, as defined in Section 01 6116.
    2. If wet-applied, have lower VOC content, as defined in Section 01 6116.
    3. Are extracted, harvested, and/or manufactured closer to the location of the project.
    4. Have longer documented life span under normal use.

5. Result in less construction waste. See Section 01 7419
6. Are made of vegetable materials that are rapidly renewable.
7. Are made of recycled materials.
8. If made of wood, are made of sustainably harvested wood, wood chips, or wood fiber.
9. Have a published Environmental Product Declaration (EPD).
10. Have a published Health Product Declaration (HPD).
11. Are Living Building Challenge Red List Free.
12. Have a published Declare Label.

2.04 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.05 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

A. See Section 01 2500 - Substitution Procedures.

3.02 OWNER-SUPPLIED PRODUCTS

A. Owner's Responsibilities:
1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
2. Arrange and pay for product delivery to site.
3. On delivery, inspect products jointly with Contractor.
4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
5. Arrange for manufacturers' warranties, inspections, and service.

B. Contractor's Responsibilities:
1. Review Owner reviewed shop drawings, product data, and samples.
2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
3. Handle, store, install and finish products.
4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. Transport and handle products in accordance with manufacturer's instructions.

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 7419.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.

G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

H. Comply with manufacturer's warranty conditions, if any.

I. Do not store products directly on the ground.

J. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

K. Prevent contact with material that may cause corrosion, discoloration, or staining.

L. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

M. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

3.05 INSTALLATION OF PRODUCTS

A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.

B. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION

SECTION 01 6116 - VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for Indoor-Emissions-Restricted products.

B. Requirements for VOC-Content-Restricted products.

1.02 RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Submittal procedures.

B. Section 01 4000 - Quality Requirements: Procedures for testing and certifications.

C. Section 01 6000 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.

1.03 DEFINITIONS

A. Indoor-Emissions-Restricted Products: All products in the following product categories, whether specified or not:
   1. Interior paints and coatings applied on site.
   2. Interior adhesives and sealants applied on site, including flooring adhesives.
   3. Flooring.
   4. Composite wood.
   5. Products making up wall and ceiling assemblies.
   6. Other products when specifically stated in the specifications.

B. VOC-Content-Restricted Products: All products in the following product categories, whether specified or not:
   1. Interior paints and coatings applied on site.
   2. Interior adhesives and sealants applied on site, including flooring adhesives.
   3. Wet-applied roofing and waterproofing.
   4. Other products when specifically stated in the specifications.

C. Interior of Building: Anywhere inside the exterior weather barrier.

D. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.

E. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

F. Inherently Non-Emitting Materials: Products composed wholly of minerals or metals, unless they include organic-based surface coatings, binders, or sealants; and specifically the following:
   1. Concrete.
   2. Clay brick.
   3. Metals that are plated, anodized, or powder-coated.
   4. Glass.
   5. Ceramics.

6. Solid wood flooring that is unfinished and untreated.

1.04 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

B. ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings; 2005 (Reapproved 2013).

C. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers; 2017, v1.2.

D. CARB (ATCM) - Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products; California Air Resources Board; current edition.

E. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board; 2007.

F. CHPS (HPPD) - High Performance Products Database; Current Edition at www.chps.net/.

G. CRI (GLP) - Green Label Plus Testing Program - Certified Products; Current Edition.

H. SCAQMD 1113 - Architectural Coatings; 1977 (Amended 2016).

I. SCAQMD 1168 - Adhesive and Sealant Applications; 1989 (Amended 2017).

J. SCS (CPD) - SCS Certified Products; Current Edition.

K. UL (GGG) - GREENGUARD Gold Certified Products; Current Edition.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: For each VOC-restricted product used in the project, submit evidence of compliance.

1.06 QUALITY ASSURANCE

A. Indoor Emissions Standard and Test Method: CAL (CDPH SM), using Standard Private Office exposure scenario and the allowable concentrations specified in the method, and range of total VOC's after 14 days.
   1. Wet-Applied Products: State amount applied in mass per surface area.
   2. Paints and Coatings: Test tinted products, not just tinting bases.
   3. Evidence of Compliance: Acceptable types of evidence are the following;
      a. Current UL (GGG) certification.
      b. Current SCS (CPD) Floorscore certification.
      c. Current SCS (CPD) Indoor Advantage Gold certification.
      d. Current listing in CHPS (HPPD) as a low-emitting product.
      e. Current CRI (GLP) certification.
      f. Test report showing compliance and stating exposure scenario used.
   4. Product data submittal showing VOC content is NOT acceptable evidence.
   5. Manufacturer's certification without test report by independent agency is NOT acceptable evidence.

B. VOC Content Test Method: 40 CFR 59, Subpart D (EPA Method 24), or ASTM D3960, unless otherwise indicated.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Report of laboratory testing performed in accordance with requirements.
      b. Published product data showing compliance with requirements.

C. Composite Wood Emissions Standard: CARB (ATCM) for ultra-low emitting formaldehyde (ULEF) resins.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Current SCS "No Added Formaldehyde (NAF)" certification; www.scscertified.com.
      b. Report of laboratory testing performed in accordance with requirements.
      c. Published product data showing compliance with requirements.

D. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS

2.01 MATERIALS

A. All Products: Comply with the most stringent of federal, State, and local requirements, or these specifications.

B. Indoor-Emissions-Restricted Products: Comply with Indoor Emissions Standard and Test Method, except for:
   1. Composite Wood, Wood Fiber, and Wood Chip Products: Comply with Composite Wood Emissions Standard or contain no added formaldehyde resins.
   2. Inherently Non-Emitting Materials.

C. VOC-Content-Restricted Products: VOC content not greater than required by the following:
   1. Adhesives, Including Flooring Adhesives: SCAQMD 1168 Rule.
   2. Joint Sealants: SCAQMD 1168 Rule.
   3. Paints and Coatings: Each color; most stringent of the following:
      a. 40 CFR 59, Subpart D.
      b. SCAQMD 1113 Rule.
      c. CARB (SCM).
   4. Wet-Applied Roofing and Waterproofing: Comply with requirements for paints and coatings.

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.

B. Additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

END OF SECTION

SECTION 01 7000 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.

C. Pre-installation meetings.

D. Cutting and patching.

E. Cleaning and protection.

F. Starting of systems and equipment.

G. Demonstration and instruction of Owner personnel.

H. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

I. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.

B. Section 01 3000 - Administrative Requirements: Submittals procedures.

C. Section 01 4000 - Quality Requirements: Testing and inspection procedures.

D. Section 01 5000 - Temporary Facilities and Controls: Temporary exterior enclosures.

E. Section 01 5000 - Temporary Facilities and Controls: Temporary interior partitions.

F. Section 01 7800 - Closeout Submittals: Project record documents, operation and maintenance data, warranties, and bonds.

G. Section 07 8400 - Firestopping.

1.03 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.

3. Efficiency, maintenance, or safety of any operational element.
4. Visual qualities of sight exposed elements.
5. Work of Owner or separate Contractor.

C. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.05 PROJECT CONDITIONS

A. Use of explosives is not permitted.

B. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

C. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
1. Minimize amount of bare soil exposed at one time.
2. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

D. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

E. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

1.06 COORDINATION

A. See Section 01 1000 for occupancy-related requirements.

B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

C. Notify affected utility companies and comply with their requirements.

D. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

E. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

G. Coordinate completion and clean-up of work of separate sections.

H. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Architect four days in advance of meeting date.

D. Prepare agenda and preside at meeting:
   1. Review conditions of examination, preparation and installation procedures.
   2. Review coordination with related work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

A. Promptly notify Architect of any discrepancies discovered.

3.05 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as indicated.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction indicated on drawings .

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
   1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
   2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.

D. Remove existing work as indicated and as required to accomplish new work.
   1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
   2. Remove items indicated on drawings.
   3. Relocate items indicated on drawings.
   4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.

5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
   2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
   3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
      a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
      b. See Section 01 1000 for other limitations on outages and required notifications.
      c. Provide temporary connections as required to maintain existing systems in service.
   4. Verify that abandoned services serve only abandoned facilities.
   5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

F. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.

G. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
   1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
   2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
   3. Where a change of plane of 1/4 inch (6 mm) or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.
   4. Trim existing wood doors as necessary to clear new floor finish. Refinish trim as required.

H. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

I. Refinish existing surfaces as indicated:
   1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
   2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

J. Clean existing systems and equipment.

K. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

L. Do not begin new construction in alterations areas before demolition is complete.

M. Comply with all other applicable requirements of this section.

3.07 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. See Alterations article above for additional requirements.

C. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-complying work.

D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

E. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

G. Restore work with new products in accordance with requirements of Contract Documents.

H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 8400, to full thickness of the penetrated element.

J. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.08 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.09 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.10 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify Architect and Owner seven days prior to start-up of each item.

C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify that wiring and support components for equipment are complete and tested.

F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.11 DEMONSTRATION AND INSTRUCTION

A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.

B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

3.12 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.13 FINAL CLEANING

A. Use cleaning materials that are nonhazardous.

B. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

C. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

D. Clean filters of operating equipment.

E. Clean debris from roofs and drainage systems.

F. Clean site; sweep paved areas, rake clean landscaped surfaces.

G. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.14 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.

D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.

H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

3.15 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION

SECTION 01 7419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. Owner requires that this project generate the least amount of trash and waste possible.

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

D. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
   1. Aluminum and plastic beverage containers.
   2. Corrugated cardboard.
   3. Wood pallets.
   4. Clean dimensional wood: May be used as blocking or furring.
   5. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.

E. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, incineration, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.

F. Methods of trash/waste disposal that are not acceptable are:
   1. Burning on the project site.
   2. Burying on the project site.
   3. Dumping or burying on other property, public or private.
   4. Other illegal dumping or burying.

G. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
   1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
   2. Submit Report on a form acceptable to Owner.
   3. Landfill Disposal: Include the following information:
      a. Identification of material.
      b. Amount, in tons or cubic yards (cubic meters), of trash/waste material from the project disposed of in landfills.
      c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
      d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
   4. Incinerator Disposal: Include the following information:
      a. Identification of material.
      b. Amount, in tons or cubic yards (cubic meters), of trash/waste material from the project delivered to incinerators.
      c. State the identity of incinerators, total amount of fees paid to incinerator, and total disposal cost.
      d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
   5. Recycled and Salvaged Materials: Include the following information for each:

a. Identification of material, including those retrieved by installer for use on other projects.
b. Amount, in tons or cubic yards (cubic meters), date removed from the project site, and receiving party.
c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.

6. Material Reused on Project: Include the following information for each:
   a. Identification of material and how it was used in the project.
   b. Amount, in tons or cubic yards (cubic meters).
   c. Include weight tickets as evidence of quantity.
7. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

PART 2 PRODUCTS

2.01 PRODUCT SUBSTITUTIONS

A. See Section 01 6000 - Product Requirements for substitution submission procedures.

B. For each proposed product substitution, submit the following information in addition to requirements specified in Section 01 6000:
   1. Relative amount of waste produced, compared to specified product.
   2. Cost savings on waste disposal, compared to specified product, to be deducted from the Contract Sum.
   3. Proposed disposal method for waste product.
   4. Markets for recycled waste product.

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES

A. See Section 01 3000 for additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. See Section 01 5000 for additional requirements related to trash/waste collection and removal facilities and services.

C. See Section 01 6000 for waste prevention requirements related to delivery, storage, and handling.

D. See Section 01 7000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings.
   1. Prebid meeting.
   2. Preconstruction meeting.
   3. Regular job-site meetings.

E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
   1. Provide containers as required.
   2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
   3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION

SECTION 01 7800 - CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

B. Section 01 7000 - Execution and Closeout Requirements: Contract closeout procedures.

C. Individual Product Sections: Specific requirements for operation and maintenance data.

D. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.

B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
   4. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Reviewed shop drawings, product data, and samples.
6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
1. Manufacturer's name and product model and number.
2. Product substitutions or alternates utilized.
3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
3. Field changes of dimension and detail.
4. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:
1. Product data, with catalog number, size, composition, and color and texture designations.
2. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

D. Additional information as specified in individual product specification sections.

E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Binders: Commercial quality, 8-1/2 by 11 inch (216 by 280 mm) three D side ring binders with durable plastic covers; 2 inch (50 mm) maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

H. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.

I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

J. Arrangement of Contents: Organize each volume in parts as follows:
   1. Project Directory.
   2. Table of Contents, of all volumes, and of this volume.
   3. Operation and Maintenance Data: Arranged by system, then by product category.
      a. Source data.
      b. Product data, shop drawings, and other submittals.
      c. Operation and maintenance data.
      d. Field quality control data.
      e. Photocopies of warranties and bonds.
   4. Design Data: To allow for addition of design data furnished by Architect or others, provide a tab labeled "Design Data" and provide a binder large enough to allow for insertion of at least 20 pages of typed text.

3.05 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

E. Manual: Bind in commercial quality 8-1/2 by 11 inch (216 by 279 mm) three D side ring binders with durable plastic covers.

F. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.

G. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

END OF SECTION

SECTION 02 4100 - DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Selective demolition of building elements for alteration purposes.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Limitations on Contractor's use of site and premises.

B. Section 01 7000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

C. Section 01 7419 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with other requirements specified in Section 01 7000.

B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Comply with applicable requirements of NFPA 241.
   3. Use of explosives is not permitted.
   4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   5. Provide, erect, and maintain temporary barriers and security devices.
   6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   8. Do not close or obstruct roadways or sidewalks without permit.
   9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
   10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

C. Do not begin removal until receipt of notification to proceed from Owner.

D. Do not begin removal until built elements to be salvaged or relocated have been removed.

E. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.

F. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

G. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

H. Perform demolition in a manner that maximizes salvage and recycling of materials.
   1. Comply with requirements of Section 01 7419 - Waste Management.
   2. Dismantle existing construction and separate materials.
   3. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

3.02 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

3.03 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as indicated.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction indicated on drawings .

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

D. Remove existing work as indicated and as required to accomplish new work.
   1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
   2. Remove items indicated on drawings.

E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
   2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   3. See Section 01 1000 for other limitations on outages and required notifications.
   4. Verify that abandoned services serve only abandoned facilities before removal.
   5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

F. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch as specified for patching new work.

3.04 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Remove from site all materials not to be reused on site; comply with requirements of Section 01 7419 - Waste Management.

C. Leave site in clean condition, ready for subsequent work.

D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 03 2000 - CONCRETE REINFORCING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Reinforcing steel for cast-in-place concrete.

B. Supports and accessories for steel reinforcement.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete.

1.03 REFERENCE STANDARDS

A. ACI 301 - Specifications for Structural Concrete; 2016.

B. ACI SP-66 - ACI Detailing Manual; 2004.

C. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2016.

D. ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement; 2016.

E. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2017.

F. AWS D1.4/D1.4M - Structural Welding Code - Reinforcing Steel; 2011.

G. CRSI (DA4) - Manual of Standard Practice; 2009.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Comply with requirements of ACI SP-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.

C. Manufacturer's Certificate: Certify that products supplied for this project meet or exceed specified requirements.

D. Reports: Submit certified copies of mill test report of reinforcement materials analysis.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301.

B. Welders' Certificates: Submit certifications for welders employed on the project, verifying AWS qualification within the previous 12 months.

PART 2 PRODUCTS

2.01 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa).
   1. Deformed billet-steel bars.
   2. Unfinished.

B. Reinforcing Steel: ASTM A706/A706M, deformed low-alloy steel bars.
   1. Unfinished.

C. Steel Welded Wire Reinforcement (WWR): Plain type; ASTM A1064/A1064M.
   1. Form: Flat Sheets.

D. Reinforcement Accessories:
   1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch (1.29 mm).
   2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
   3. Provide stainless steel components for placement within 1-1/2 inches (38 mm) of weathering surfaces, unless noted otherwise on Structural drawings. Wood materials are prohibited.

2.02 FABRICATION

A. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.

B. Welding of reinforcement is permitted only with the specific approval of Architect. Perform welding in accordance with AWS D1.4/D1.4M.

C. Locate reinforcing splices not indicated on drawings at point of minimum stress.
   1. Review locations of splices with Structural Engineer.

PART 3 EXECUTION

3.01 PLACEMENT

A. Place, support and secure reinforcement against displacement. Do not deviate from required position.
   1. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

B. Do not cut, puncture, displace or damage vapor barrier. Repair damage and reseal vapor retarder before placing concrete.

C. Accommodate placement of formed openings.

D. Comply with applicable code for concrete cover over reinforcement.

E. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

F. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

3.02 FIELD QUALITY CONTROL

A. An independent testing agency, as specified in Section 01 4000 - Quality Requirements, will inspect installed reinforcement for compliance with contract documents before concrete placement.

END OF SECTION

SECTION 03 3000 - CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete formwork.

B. Elevated concrete slabs.

C. Floors and slabs on grade.

D. Joint devices associated with concrete work.

E. Miscellaneous concrete elements, including equipment pads.

F. Concrete curing.

1.02 RELATED REQUIREMENTS

A. Section 03 2000 - Concrete Reinforcing.

B. Section 07 9200 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.

1.03 REFERENCE STANDARDS

A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).

B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).

C. ACI 301 - Specifications for Structural Concrete; 2016.

D. ACI 302.1R - Guide to Concrete Floor and Slab Construction; 2015.

E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).

F. ACI 305R - Guide to Hot Weather Concreting; 2010.

G. ACI 306R - Guide to Cold Weather Concreting; 2016.

H. ACI 308R - Guide to External Curing of Concrete; 2016.

I. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2014 (Errata 2017).

J. ACI 347R - Guide to Formwork for Concrete; 2014.

K. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2016, with Editorial Revision (2016).

L. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2018.

M. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2017a.

N. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2016a.

O. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2015a.

P. ASTM C150/C150M - Standard Specification for Portland Cement; 2018.

Q. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2016.

R. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2015.

S. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2014.

T. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2014a.

U. ASTM C1116/C1116M - Standard Specification for Fiber-Reinforced Concrete; 2010a (Reapproved 2015).

V. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2012.

W. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004, with Editorial Revision (2013).

X. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting; 2015.

Y. ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2011 (Reapproved 2017).

Z. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017.

AA. NSF 61 - Drinking Water System Components - Health Effects; 2017.

AB. NSF 372 - Drinking Water System Components - Lead Content; 2016.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
   1. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.

C. Mix Design: Submit proposed concrete mix design, as it complies with General Structural Notes.
   1. Employ an independent testing laboratory to test proposed aggregate and design concrete mixes for each type of concrete required.

2. Submit aggregate test reports and mix designs for approval 14 days prior to placing concrete.
3. Test each type of fine and coarse aggregate for conformance to ASTM C33-78.
4. Design mixes in accordance with ACI 301, Section 3.8.2, Method 1 or Method 2.
5. Indicate proposed mix design complies with requirements of ACI 318, Chapter 5 - Concrete Quality, Mixing and Placing and General Structural Notes.

D. Samples: Submit samples of underslab vapor retarder to be used.

E. Test Reports: Submit report for each test or series of tests specified.

F. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.

G. Sustainable Design Submittal: If any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is used in mix designs to replace Portland cement, submit the total volume of concrete cast in place, mix design(s) used showing the quantity of portland cement replaced, reports showing successful cylinder testing, and temperature on day of pour if cold weather mix is used.

H. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301 and ACI 318.

B. Follow recommendations of ACI 305R when concreting during hot weather.

C. Follow recommendations of ACI 306R when concreting during cold weather.

PART 2 PRODUCTS

2.01 FORMWORK

A. Formwork Design and Construction: Comply with guidelines of ACI 347R to provide formwork that will produce concrete complying with tolerances of ACI 117.

B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
2. Earth Cuts: Do not use earth cuts as forms for vertical surfaces. Natural rock formations that maintain a stable vertical edge may be used as side forms.
3. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
4. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches (38 mm) of concrete surface.

2.02 REINFORCEMENT MATERIALS

A. Comply with requirements of Section 03 2000.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I/II Portland type, unless noted otherwise in Structural Drawings.

B. Fine and Coarse Aggregates: ASTM C33/C33M.
   1. Acquire aggregates for entire project from same source.

C. Fly Ash: ASTM C618, Class C or F.

D. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

E. Structural Fiber Reinforcement: ASTM C1116/C1116M.
   1. Fiber Type: Alkali-resistant synthetic.

2.04 ADMIXTURES

A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

B. Admixtures may also be added as indicated in General Structural Notes.

2.05 ACCESSORY MATERIALS

A. Underslab Vapor Retarder <VPR RET-4>:
   1. Sheet Material: ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. Single ply polyethylene is prohibited.
   2. Permeance of less than 0.01 perms as tested in accordance with ASTM F 1249.
   3. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
   4. Manufacturers:
      a. ISI Building Products; Viper VaporCheck II 15-mil (Class A): www.isibp.com/#sle.
      b. Poly-America; Husky Yellow Guard 15-mil Vapor Barrier: www.yellowguard.com/#sle.
      c. Stego Industries, LLC; Stego Wrap Vapor Barrier (15-mil): www.stegoindustries.com/#sle.
      d. W. R. Meadows, Inc; PERMINATOR Class A - 15 mils (0.38 mm): www.wrmeadows.com/#sle.
      e. Raven Industries; VaporBlock VB 15: www.ravenefd.com.
      f. Substitutions: See Section 01 6000 - Product Requirements.

B. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
   1. Grout: Comply with ASTM C1107/C1107M.
   2. Minimum Compressive Strength at 48 Hours, ASTM C109/C109M: 2,000 pounds per square inch (13.7 MPa).
   3. Minimum Compressive Strength at 28 Days, ASTM C109/C109M: 7,000 pounds per square inch (48 MPa).

2.06 BONDING AND JOINTING PRODUCTS

A. Waterstops: Bentonite and butyl rubber, complying with NSF 61 and NSF 372.
   1. Configuration: As indicated on drawings.
   2. Size: As indicated on drawings.

B. Slab Isolation Joint Filler: 1/2 inch (13 mm) thick, height equal to slab thickness, with removable top section that will form 1/2 inch (13 mm) deep sealant pocket after removal.
   1. Material: ASTM D1751, cellulose fiber.

C. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with rectangular or round knockout holes for conduit or rebar to pass through joint form at 6 inches (150 mm) on center; ribbed steel stakes for setting.

2.07 CURING MATERIALS

A. Moisture-Retaining Sheet: ASTM C171.
   1. Curing paper, regular.
   2. White-burlap-polyethylene sheet, weighing not less than 3.8 ounces per square yard (1.71 kg/sq m).

B. Polyethylene Film: ASTM D2103, 4 mil, 0.004 inch (0.102 mm) thick, clear.

C. Water: Potable, not detrimental to concrete.

2.08 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
   1. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with ACI recommendations maximum replacement percentage noted in mix designs listed in general structural notes is not be exceeded.

B. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.

C. All design mixes are to comply with requirements stated within the general structural notes of the structural construction documents.

2.09 MIXING

A. On Project Site: Mix in drum type batch mixer, complying with ASTM C685/C685M. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.

B. Transit Mixers: Comply with ASTM C94/C94M.

C. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.

B. Verify that forms are clean and free of rust before applying release agent.

C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.

E. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.

F. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Comply with ASTM E1643. Lap joints minimum 6 inches (150 mm). Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.

3.03 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Place concrete for floor slabs in accordance with ACI 302.1R.

C. Notify Architect not less than 24 hours prior to commencement of placement operations.

D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

E. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

F. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.

G. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.04 SLAB JOINTING

A. Locate joints as indicated on drawings.

B. Anchor joint fillers and devices to prevent movement during concrete placement.

C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
   1. Install wherever necessary to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, manholes, sumps, and drains.

D. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch (5 mm) thick blade and cut at least 1 inch (25 mm) deep but not less than one quarter (1/4) the depth of the slab.

E. Construction Joints: Where not otherwise indicated, use metal combination screed and key form, with removable top section for joint sealant.

3.05 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. Maximum Variation of Surface Flatness:
   1. Exposed Concrete Floors: 1/4 inch (6 mm) in 10 feet (3 m).

2. Under Seamless Resilient Flooring: 1/4 inch (6 mm) in 10 feet (3 m).
3. Under Carpeting: 1/4 inch (6 mm) in 10 feet (3 m).

B. Correct the slab surface if tolerances are less than specified.

C. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.06 CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.

B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch (6 mm) or more in height.

C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch (6 mm) or more in height. Provide finish as follows:
1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.

D. Concrete Slabs <CFIN-1>: Finish to requirements of ACI 302.1R, and as follows:
1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI 302.1R; thick floor coverings include quarry tile, ceramic tile, and Portland cement terrazzo with full bed setting system.
2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
3. Decorative Exposed Surfaces: Trowel as described in ACI 302.1R; take measures necessary to avoid black-burnish marks; decorative exposed surfaces include surfaces to be stained or dyed, pigmented concrete, surfaces to receive liquid hardeners, surfaces to receive dry-shake hardeners, surfaces to be polished, and all other exposed slab surfaces.

E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:50 nominal, unless noted otherwise in the drawings.

3.07 CURING AND PROTECTION

A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. Surfaces Not in Contact with Forms:
1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
    a. Spraying: Spray water over floor slab areas and maintain wet.
    b. Saturated Burlap: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides; maintain in place.

3. Final Curing: Begin after initial curing but before surface is dry.
    a. Moisture-Retaining Sheet: Lap strips not less than 3 inches (75 mm) and seal with waterproof tape or adhesive; secure at edges.
    b. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

3.08 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

D. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.

E. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards (76 cu m) or less of each class of concrete placed.

F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

3.09 DEFECTIVE CONCRETE

A. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.

B. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.10 PROTECTION

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION

SECTION 04 2000 - UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete block.

B. Reinforcement and anchorage.

C. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2016.

C. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2016.

D. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2017.

E. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2016a.

F. ASTM C91/C91M - Standard Specification for Masonry Cement; 2012.

G. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2017.

H. ASTM C140/C140M - Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units; 2017a.

I. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2017.

J. ASTM C150/C150M - Standard Specification for Portland Cement; 2018.

K. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006 (Reapproved 2011).

L. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2011.

M. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2017.

N. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2016.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.

C. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

D. Manufacturer's Certificate: Certify that water repellent admixture manufacturer has certified masonry unit manufacturer as an approved user of water repellent admixture in the manufacture of concrete block.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
   1. Size: Standard units with nominal face dimensions of 16 by 8 inches (400 by 200 mm) and nominal depths as indicated on drawings for specific locations.
   2. Special Shapes: Provide non-standard blocks configured for corners.
   3. Load-Bearing Units: ASTM C90, normal weight.
      a. Hollow block.
   4. Non-Loadbearing Units: ASTM C129.
      a. Hollow block.
   5. Patterns and Faces:
      a. <CMU-1>: Manufacturer's standard color and texture.
      b. Supplier of prefinished or integrally colors units shall guarantee that the finished product will not be stained or damaged due to iron or shale deposits in the face for a period of 5 years.

2.02 MORTAR AND GROUT MATERIALS

A. Masonry Cement: ASTM C91/C91M, Type S.

B. Portland Cement: ASTM C150/C150M, Type I.

C. Hydrated Lime: ASTM C207, Type S.

D. Mortar Aggregate: ASTM C144.

E. Grout Aggregate: ASTM C404.

F. Water: Clean and potable.

2.03 REINFORCEMENT AND ANCHORAGE

A. Manufacturers:
   1. Blok-Lok Limited: www.blok-lok.com.
   2. Hohmann & Barnard, Inc: www.h-b.com/sle.
   3. WIRE-BONDwww.wirebond.com/#sle.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa), deformed billet bars; galvanized.

C. Joint Reinforcement: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.

D. Single Wythe Joint Reinforcement: ASTM A951/A951M.
   1. Type: Ladder.
   2. Material: ASTM A1064/A1064M steel wire, hot dip galvanized after fabrication to ASTM A153/A153M, Class B.
   3. Size: 0.1483 inch (3.8 mm) side rods with 0.1483 inch (3.8 mm) cross rods; width as required to provide not less than 5/8 inch (16 mm) of mortar coverage on each exposure.

E. Adjustable Multiple Wythe Joint Reinforcement: ASTM A951/A951M.
   1. Type: Truss, with adjustable ties or tabs spaced at 16 in (406 mm) on center.
   2. Material: ASTM A1064/A1064M steel wire, hot dip galvanized after fabrication to ASTM A153/A153M, Class B.
   3. Size: 0.1875 inch (4.8 mm) side rods with 0.1483 inch (3.8 mm) cross rods and adjustable components of 0.1875 inch (4.8 mm)wire, width of components as required to provide not less than 5/8 inch (16 mm) of mortar coverage from each masonry face.
   4. Vertical adjustment: Not more than 1 1/4 inches (32 mm).
   5. Insulation Clips: Provide clips at tabs or ties designed to secure insulation against outer face of inner wythe of masonry.

2.04 ACCESSORIES

A. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.
   1. Acceptable Products: Contractor’s option to achieve the specified results without damage to masonry or surrounding materials, such as Sure Klean by Prosoco or other product with similar properties.
   2. Use in strict accordance with manufacturer's written instructions.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

C. All shoring during erection is at the responsibility of the General Contractor and the Masonry Installer.

3.03 COLD AND HOT WEATHER REQUIREMENTS

A. Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

3.04 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Concrete Masonry Units:
   1. Bond: Running.
   2. Mortar Joints: Concave.

3.05 PLACING AND BONDING

A. Lay hollow masonry units with face shell bedding on head and bed joints.

B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

C. Remove excess mortar and mortar smears as work progresses.

D. Interlock intersections and external corners, except for units laid in stack bond.

E. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

F. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

G. Isolate masonry partitions from vertical structural framing members with a control joint.

H. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.06 REINFORCEMENT AND ANCHORAGE - GENERAL and SINGLE WYTHE MASONRY

A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches (400 mm) on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches (400 mm) each side of opening.

C. Lap joint reinforcement ends minimum 6 inches (150 mm).

3.07 LINTELS

A. Install loose steel lintels over openings.

B. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.
   1. Openings over 48 inches not scheduled: Contact Structural Engineer.

3.08 GROUTED COMPONENTS

A. Follow lap splice requirements as indicated in Structural drawings.

B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch (13 mm) of dimensioned position.

C. Place and consolidate grout fill without displacing reinforcing.

3.09 TOLERANCES

A. Maximum Variation From Unit to Adjacent Unit: 1/16 inch (1.6 mm).

B. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft (6 mm/3 m) and 1/2 inch in 20 ft (13 mm/6 m) or more.

C. Maximum Variation from Plumb: 1/4 inch (6 mm) per story non-cumulative; 1/2 inch (13 mm) in two stories or more.

D. Maximum Variation from Level Coursing: 1/8 inch in 3 ft (3 mm/m) and 1/4 inch in 10 ft (6 mm/3 m); 1/2 inch in 30 ft (13 mm/9 m).

E. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch (minus 6.4 mm, plus 9.5 mm).

F. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch (6 mm).

3.10 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

B. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C140/C140M for compliance with requirements of this specification.

C. Mortar Tests: Test each type of mortar in accordance with ASTM C780, testing with same frequency as masonry samples.

3.11 CLEANING

A. Remove excess mortar and mortar droppings.

B. Clean soiled surfaces with cleaning solution.

3.12 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 05 1200 - STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural steel framing members.

B. Structural steel support members.

C. Base plates, shear stud connectors.

D. Grouting under base plates.

1.02 RELATED REQUIREMENTS

A. Section 05 3100 - Steel Decking: Support framing for small openings in deck.

B. Section 05 5000 - Metal Fabrications: Steel fabrications affecting structural steel work.

C. Section 05 5100 - Metal Stairs: Steel Stair fabrications affecting structural steel work.

1.03 REFERENCE STANDARDS

A. AISC (MAN) - Steel Construction Manual 2017.

B. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges 2016.

C. ASTM A1 - Standard Specification for Carbon Steel Tee Rails 2000 (Reapproved 2018).

D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

E. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2020.

F. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished 2018.

G. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.

H. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.

I. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2021.

J. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021a.

K. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts 2015.

L. ASTM A563M - Standard Specification for Carbon and Alloy Steel Nuts (Metric) 2007 (Reapproved 2013).

M. ASTM A992/A992M - Standard Specification for Structural Steel Shapes 2020.

N. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021.

O. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.

P. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink) 2017.

Q. ASTM E94/E94M - Standard Guide for Radiographic Examination Using Industrial Radiographic Film 2017.

R. ASTM E164 - Standard Practice for Contact Ultrasonic Testing of Weldments 2019.

S. ASTM E165/E165M - Standard Test Method for Liquid Penetrant Examination for General Industry 2018.

T. ASTM E709 - Standard Guide for Magnetic Particle Testing 2021.

U. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength 2019, with Editorial Revision (2020).

V. ASTM F959/F959M - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners, Inch and Metric Series 2017a.

W. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength 2020.

X. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2012.

Y. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020.

Z. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel 2018.

AA. ITS (DIR) - Directory of Listed Products current edition.

BB. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections 2014, with Errata (2015).

CC. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer 1999 (Ed. 2004).

DD. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic") 2002 (Ed. 2004).

EE. SSPC-SP 3 - Power Tool Cleaning 2018.

FF. UL (FRD) - Fire Resistance Directory Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings:
   1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
   2. Connection, including connections not detailed..
   3. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.

C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.

D. Mill Test Reports: Indicate structural strength, destructive test analysis and non-destructive test analysis.

E. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

F. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.05 QUALITY ASSURANCE

A. Fabricate structural steel members in accordance with AISC (MAN) "Steel Construction Manual."

B. Structural steel members designated as architecturally-exposed structural steel (AESS) to also comply with Section 05 1213.

C. Maintain one copy of each document on site.

D. Fabricator: Company specializing in performing the work of this section with minimum 5 years years of documented experience.

E. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.

F. Erector: Company specializing in performing the work of this section with minimum 5 years years of documented experience.

PART 2 PRODUCTS

2.01 MATERIALS

A. Steel Angles and Plates: ASTM A36/A36M.

B. Steel W Shapes and Tees: ASTM A992/A992M.

C. Rolled Steel Structural Shapes: ASTM A992/A992M.

D. Cold-Formed Structural Tubing: ASTM A500/A500M, Grade B.

E. Shear Stud Connectors: Made from ASTM A108 Grade 1015 through 1020 bars.

F. Structural Bolts and Nuts: Carbon steel, ASTM A307, Grade A.

G. High-Strength Structural Bolts, Nuts, and Washers: ASTM A325 or ASTM A325M, Type 1, medium carbon, plain, with matching compatible ASTM A563 or ASTM A563M nuts and ASTM F436 washers.

H. Tension Control Bolts: Twist-off type; ASTM F3125/F3125M.

I. Headed Anchor Rods: ASTM F1554 Grade 36, plain.

J. Load Indicator Washers: Provide washers complying with ASTM F959/F959M at connections requiring high-strength bolts.

K. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

L. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
   1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch.
   2. Minimum Compressive Strength at 28 Days: 5,000 pounds per square inch.

M. Shop and Touch-Up Primer: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

N. Touch-Up Primer for Galvanized Surfaces: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

A. Shop fabricate to greatest extent possible.

B. Space shear stud connectors as indicated on drawings.

C. Continuously seal joined members by continuous welds. Grind exposed welds smooth.

D. Fabricate connections for bolt, nut, and washer connectors.

E. Develop required camber for members.

2.03 FINISH

A. Prepare structural component surfaces in accordance with SSPC-SP 3.

B. Shop prime structural steel members. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted.

C. Galvanize structural steel members to comply with ASTM A123/A123M. Provide minimum 1.7 oz/sq ft galvanized coating.

2.04 SOURCE QUALITY CONTROL

A. High-Strength Bolts: Provide testing and verification of shop-bolted connections in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts", testing at least 50 percent of bolts at each connection.

B. Welded Connections: Visually inspect all shop-welded connections and test at least 10 percent of welds using one of the following:
   1. Radiographic testing performed in accordance with ASTM E94/E94M.
   2. Ultrasonic testing performed in accordance with ASTM E164.
   3. Liquid penetrant inspection performed in accordance with ASTM E165/E165M.

4. Magnetic particle inspection performed in accordance with ASTM E709.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

3.02 ERECTION

A. Erect structural steel in compliance with AISC 303.

B. Allow for erection loads and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.

C. Field weld components and shear studs indicated on shop drawings.

D. Use carbon steel bolts only for temporary bracing during construction, unless otherwise specifically permitted on drawings. Install high-strength bolts in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts".

E. Do not field cut or alter structural members without approval of Architect.

F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

G. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for nonshrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

3.03 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

3.04 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

B. High-Strength Bolts: Provide testing and verification of field-bolted connections in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts", testing at least 50 percent of bolts at each connection and 100 percent of bolts at moment connections.

C. Welded Connections: Visually inspect all field-welded connections and test 100 percent of all field welded moment connections using one of the following:
   1. Radiographic testing performed in accordance with ASTM E94/E94M.
   2. Ultrasonic testing performed in accordance with ASTM E164.
   3. Liquid penetrant inspection performed in accordance with ASTM E165/E165M.
   4. Magnetic particle inspection performed in accordance with ASTM E709.

END OF SECTION

SECTION 05 3100 - STEEL DECKING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roof deck.

B. Metal form deck.

C. Supplementary framing for openings up to and including 18 inches.

D. Bearing plates and angles.

E. Stud shear connectors.

1.02 RELATED REQUIREMENTS

A. Section 03 2000 - Concrete Reinforcing.

B. Section 03 3000 - Cast-in-Place Concrete: Concrete topping over metal deck.

C. Section 03 45 00 - Precast Architectural Concrete: Placement of embedded steel anchors, dovetail slots, bearing plates, joist seats and other steel connectors in precast concrete.

D. Section 05 1200 - Structural Steel Framing: Support framing for openings larger than 18 inches and shear stud connectors.

E. Section 05 1200 - Structural Steel Framing: Placement of embedded steel anchors for bearing plates in cast-in-place concrete.

F. Section 05 5000 - Metal Fabrications: Steel angle concrete stops at deck edges.

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

B. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished 2018.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.

D. ASTM A510/A510M - Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel 2020.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.

F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021.

G. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel 2019.

H. ASTM E384 - Standard Test Method for Microindentation Hardness of Materials 2017.

I. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020.

J. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel 2018.

K. FM DS 1-28 - Wind Design 2016.

L. FM DS 1-29 - Roof Deck Securement and Above-Deck Roof Components 2016, with Editorial Revision (2020).

M. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel 2018.

N. ICC-ES AC43 - Acceptance Criteria for Steel Deck Roof and Floor Systems 2016.

O. ICC-ES AC70 - Acceptance Criteria for Fasteners Power Driven into Concrete, Steel and Masonry Elements 2016.

P. ITS (DIR) - Directory of Listed Products current edition.

Q. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

R. SDI (DM) - Publication No.30, Design Manual for Composite Decks, Form Decks, and Roof Decks 2007.

S. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer 1999 (Ed. 2004).

T. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic") 2002 (Ed. 2004).

U. UL (FRD) - Fire Resistance Directory Current Edition.

1.04 SUBMITTALS

A. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.

B. Certificates: Certify that products furnished meet or exceed specified requirements.

C. Submit manufacturer's installation instructions.

D. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

E. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.

B. Installer Qualifications: Company specializing in performing the work of this Section with minimum 5 years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Cut plastic wrap to encourage ventilation.

B. Separate sheets and store deck on dry wood sleepers; slope for positive drainage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Steel Deck:
   1. Canam Steel Corporation; [____]: www.canam-steeljoists.ws.
   2. Nucor-Vulcraft Group; [____]: www.vulcraft.com/#sle.
   3. New Millenium Building Systems.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 STEEL DECK

A. Roof Deck: Non-composite type, fluted steel sheet:
   1. Ungalvanized Steel Sheet: ASTM A1008/A1008M, Designation SS.
      a. Ungalvanized Steel Sheet is to be provided for all roof decks unless noted otherwise on drawings. See galvanizing note above.
   2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
   3. Minimum Base Metal Thickness, Excluding Finish: 20 gage, 0.0359 inch at 1-1/2 inch deck as indicated on the structural drawings.
   4. Profile: Fluted; SDI WR.
   5. Formed Sheet Width: 36 inch at 1-1/2 inch high decking and 24 inch at 3 inch high decking.
   6. Side Joints: Lapped, mechanically fastened.
   7. End Joints: Lapped, mechanically fastened.

B. Metal Form Deck: Corrugated sheet steel, with provision for ventilation of concrete:
   1. Ungalvanized Steel Sheet: ASTM A1008/A1008M, Designation SS, Grade 33, Type 1.
   2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
   3. Minimum Base Metal Thickness: 22 gage, [____] inch.
   4. Nominal Height: 1/2" inch.
   5. Formed Sheet Width: 36" inch.
   6. Side Joints: Lapped, mechanically fastened.
   7. End Joints: Lapped, welded.

2.03 ACCESSORY MATERIALS

A. Bearing Plates and Angles: ASTM A36/A36M steel, galvanized per ASTM A123/A123M.

B. Stud Shear Connectors: Made from ASTM A108 Grade 1015 through 1020 bars.

C. Welding Materials: AWS D1.1/D1.1M.

D. Fasteners: Galvanized hardened steel, self tapping.

E. Powder Actuated Mechanical Fasteners: Steel; with knurled shank and forged ballistic point. Comply with applicable requirements of ICC-ES AC70.

1. Design Requirements: Provide number and type of fasteners that comply with the applicable requirements of SDI (DM) design method for roof deck and floor deck applications and ICC-ES AC43.
2. Material: Steel; ASTM A510/A510M.
    a. Hardness: Rockwell C 54.5, minimum.
    b. Tensile Strength: 285 kips per square inch, minimum.
    c. Shear Strength: 175 kips per square inch, minimum.

F. Mechanical Fasteners: Steel; hex washer head, self-drilling, self-tapping.
1. Design Requirements for Sidelap Connections: Provide number and type of fasteners that comply with the applicable requirements of SDI (DM) design method for roof deck and floor deck applications and ICC-ES AC43.
2. Fasteners for Steel Roof Decks Protected with Waterproofing Membrane: ASTM B633, SC1, Type III zinc electroplate.
3. Fasteners for Exposed Steel Roof Deck Application: Manufacturer's standard stainless steel with bonded neoprene washer.

G. Weld Washers: Mild steel, uncoated, 3/4 inch outside diameter, 1/8 inch thick.

H. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

I. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.

2.04 FABRICATED DECK ACCESSORIES

A. Sheet Metal Deck Accessories: Metal closure strips, wet concrete stops, and cover plates, 22 gage, 0.0299 inch thick sheet steel; of profile and size as indicated; finished same as deck.

B. Filler Sheets at roof deck: 20 gage, 0.0359 inch as required at all deck lap edges for sidelap fastening.

C. Roof Sump Pans: Formed sheet steel, 14 gage, 0.0747 inch minimum thickness, flat bottom, sloped sides, recessed 1-1/2 inches below roof deck surface, bearing flange 3 inches wide, sealed watertight.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions prior to beginning work.

3.02 INSTALLATION

A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.

B. On steel supports provide minimum 1-1/2 inch bearing.

C. Fasten deck to steel support member at ends and intermediate supports as indicated on drawings.

D. Drive mechanical sidelap connectors completely through adjacent lapped sheets; positively engage adjacent sheets with minimum three-thread penetration.

E. At welded male/female side laps weld at 18 inches on center maximum.

F. Weld deck in accordance with AWS D1.3/D1.3M.

G. At roof and floor deck openings, provide steel framing around opening as indicated on structural drawings.

H. At floor edges, install concrete stops upturned to top surface of slab, to contain wet concrete. Provide stops of sufficient strength to remain stationary without distortion.

I. At openings between deck and walls, columns, and openings, provide sheet steel closures and angle flashings to close openings.

J. Position roof drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.

K. Weld stud shear connectors through steel deck to structural members below.

L. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.

END OF SECTION

SECTION 05 4000 - COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Formed steel stud exterior wall and interior wall framing.

B. Exterior wall sheathing.

C. Formed steel floor joist/support framing and bridging.

D. Water-resistive barrier over sheathing.

1.02 RELATED REQUIREMENTS

A. Section 05 3100 - Steel Decking.

B. Section 07 6200 - Sheet Metal Flashing and Trim: Head and sill flashings.

C. Section 09 2116 - Gypsum Board Assemblies: Gypsum-based sheathing.

D. Section 09 2216 - Non-Structural Metal Framing.

1.03 REFERENCE STANDARDS

A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members 2012.

B. ANSI A208.1 - American National Standard for Particleboard 2016.

C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.

E. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021.

F. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.

G. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board 2012, with Editorial Revision (2019).

H. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation 2019.

I. ASTM C955 - Standard Specification for Cold-Formed Steel Structural Framing Members 2018, with Editorial Revision.

J. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing 2017.

K. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board 2021.

L. ASTM C1396/C1396M - Standard Specification for Gypsum Board 2017.

M. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020.

N. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel 2018.

O. ICC-ES AC38 - Acceptance Criteria for Water-Resistive Barriers 2016, with Editorial Revision (2019).

P. PS 1 - Structural Plywood 2009 (Revised 2019).

Q. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer 1999 (Ed. 2004).

R. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic") 2002 (Ed. 2004).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with work of other sections that is to be installed in or adjacent to the metal framing system, including but not limited to structural anchors, cladding anchors, utilities, insulation, and firestopping.

1.05 SUBMITTALS

A. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, limitations.

B. Product Data: Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.

C. Manufacturer's Installation Instructions: Indicate special procedures, conditions requiring special attention, and etc..

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Steel stud supplier is required to design all interior partition wall studs, bulkheads, openings (headers, jambs, connections, etc.). Structural EOR provided structural design for exterior wall components only. G.C. is to work with and hire Professional Engineer as needed to design all interior partition framing systems. This includes bulkheads, interior windows/doors (jambs, sills, headers), interior and exterior soffits for canopys and ceilings, etc. All design required shall be under direct supervision of a professional structural engineer experienced in design and licensed in the State in which the Project is located or using tested techincal data from the steel stud supplier. All interior stud component and connection design is the responsibility of the G.C. and all issues will be at the cost and liability of the G.C.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three 5 years documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Framing:

1. ClarkDietrich; [_____]: www.clarkdietrich.com/#sle.
2. Marino; [____]: www.marinoware.com/#sle.
3. The Steel Network, Inc; [_____]: www.SteelNetwork.com/#sle.
4. Substitutions: See Section 01 6000 - Product Requirements.

B. Framing Connectors and Accessories:
1. Same manufacturer as metal framing.
2. ClarkDietrich; [_____]: www.clarkdietrich.com/#sle.
3. Simpson Strong Tie; [____]: www.strongtie.com/#sle.
4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FRAMING SYSTEM

A. Provide primary and secondary framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.

B. Shop fabricate framing system to the greatest extent possible.

C. Deliver to project site in largest practical sections.

2.03 FRAMING MATERIALS

A. Studs and Track: ASTM C955; studs formed to channel, C- or Sigma-shaped with punched web; U-shaped track in matching nominal width and compatible height.
1. Gage and Depth: As indicated on drawings.
2. Galvanized in accordance with ASTM A653/A653M, G90/Z275 coating.
3. Provide components fabricated from ASTM A1008/A1008M Designation SS (structural steel).

B. Framing Connectors: Factory-made, formed steel sheet.
1. Material: ASTM A653/A653M SS Grade 50 (minimum), with G90/Z275 hot dipped galvanized coating for base metal thickness less than 10 gage, 0.1345 inch, and factory punched holes and slots.
2. Structural Performance: Maintain load and movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
3. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
a. Where continuous studs bypass elevated floor slab, connect stud to slab in manner allowing vertical movement of slab without affecting studs as indicated on drawings to allow for minimum movement of 3/4 inch.
b. Where top of stud wall terminates below structural floor or roof, connect studs to structure in manner allowing vertical movement of slab or roof as indicated on drawings without affecting studs; allow for minimum movement of 3/4 inch.
c. Provide top track with long leg track and head of wall movement connectors; minimum track length of 10 feet.
4. Fixed Connections: Provide non-movement connections for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners.

2.04 FASTENERS

A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.

B. Anchorage Devices: Powder actuated and Screws as indicated on drawings.

C. Welding: Comply with AWS D1.1/D1.1M.

2.05 WALL SHEATHING

A. Wall Sheathing: APA Rated as indicated on drawings

B. Plywood; PS 1, Grade C-D, Exposure I.

C. Gypsum board; complying with requirements of ASTM C1396/C1396M for gypsum sheathing, [_____] long edges, 1/2 inch thick minimum (as indicated on Architectural drawings)

2.06 ACCESSORIES

A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.

B. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

C. Water-Resistive Barrier: As specified in Section 07 2500.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Verify field measurements and adjust installation as required.

3.02 INSTALLATION OF STUDS

A. Install components in accordance with manufacturers' instructions and ASTM C1007 requirements.

B. Align floor and ceiling tracks; locate to wall layout. Secure in place with fasteners at maximum 24 inches on center or as indicated on drawings. Coordinate installation of sealant with floor and ceiling tracks.

C. Place studs at 16 inches on center; not more than 2 inches from abutting walls and at each side of openings. Connect studs to tracks as indicated on drawings.

D. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.

E. Install wall studs full length in one piece. Splicing of studs is not permitted.

F. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.

G. Install intermediate studs above and below openings to align with wall stud spacing.

H. Provide deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing.

I. Attach cross studs to studs for attachment of fixtures anchored to walls.

J. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.

K. Touch-up field welds and damaged galvanized surfaces with primer.

3.03 INSTALLATION OF FLOOR JOISTS

A. Install framing components in accordance with manufacturer's instructions.

B. Make provisions for erection stresses. Provide temporary alignment and bracing.

C. Place joists at spacing indicated on drawings; not more than 1 inch from abutting walls, and connect joists to supports using fastener method.

D. Set floor joists parallel and level, with lateral bracing and bridging.

E. Touch-up field welds and damaged galvanized surfaces with primer.

3.04 INSTALLATION OF WALL SHEATHING

A. Install wall sheathing with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using self-tapping screws.
   1. Place water-resistive barrier horizontally over wall sheathing, weather lapping edges, and ends.

3.05 TOLERANCES

A. Maximum Variation from True Position: 1/4 inch.

B. Maximum Variation of any Member from Plane: 1/8 inch.

END OF SECTION

SECTION 05 5000 - METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated steel items.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.

B. Section 04 2000 - Unit Masonry: Placement of metal fabrications in masonry.

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

D. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2013.

E. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2014 (Editorial 2017).

F. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.

G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.

H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2017.

I. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.

J. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).

K. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

L. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

M. SSPC-SP 2 - Hand Tool Cleaning; 1982, with Editorial Revision (2004).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.

C. Plates: ASTM A283/A283M.

D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.

E. Slotted Channel Framing: ASTM A653/A653M, Grade 33.

F. Slotted Channel Fittings: ASTM A1011/A1011M.

G. Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.

H. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

I. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

J. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FABRICATED ITEMS

A. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking and masonry; prime paint finish.

B. Door Frames for Overhead Door Openings: Channel sections; prime paint finish.

C. Elevator Hoistway Divider Beams: Beam sections; prime paint finish.

2.04 FINISHES - STEEL

A. Prime paint steel items.
   1. Exceptions: Galvanize items to be embedded in concrete and items to be embedded in masonry.

B. Prepare surfaces to be primed in accordance with SSPC-SP2.

C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

D. Prime Painting: One coat.

E. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

2.05 FABRICATION TOLERANCES

A. Squareness: 1/8 inch (3 mm) maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch (1.5 mm).

C. Maximum Misalignment of Adjacent Members: 1/16 inch (1.5 mm).

D. Maximum Bow: 1/8 inch (3 mm) in 48 inches (1.2 m).

E. Maximum Deviation From Plane: 1/16 inch (1.5 mm) in 48 inches (1.2 m).

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components as indicated on drawings.

D. Perform field welding in accordance with AWS D1.1/D1.1M.

E. Obtain approval prior to site cutting or making adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

C. Maximum Out-of-Position: 1/4 inch (6 mm).

END OF SECTION

SECTION 05 5100 - METAL STAIRS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Stairs with concrete treads.

B. Structural steel stair framing and supports.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete fill in stair pans; mesh reinforcement for landings.

B. Section 03 3000 - Cast-in-Place Concrete: Placement of metal anchors in concrete.

C. Section 04 2000 - Unit Masonry: Placement of metal fabrications in masonry.

1.03 REFERENCE STANDARDS

A. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures; 2006.

B. ASTM A6/A6M - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling; 2017.

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

E. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2013.

F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2016.

G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2017.

H. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions; 2015a.

I. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.

J. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).

K. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

L. SSPC-SP 2 - Hand Tool Cleaning; 1982, with Editorial Revision (2004).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
   1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
   2. Include the design engineer's seal and signature on each sheet of shop drawings.

C. Welders' Certificates.

1.05 QUALITY ASSURANCE

A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.

B. Welder Qualifications: Show certification of welders employed on the Work, verifying AWS qualification within the previous 12 months.

C. Fabricator Qualifications:
   1. A qualified steel fabricator that is certified by the American Institute for Steel Construction (AISC) under AISC 201.

PART 2 PRODUCTS

2.01 METAL STAIRS - GENERAL

A. Metal Stairs: Provide stairs of the design specified, complete with landing platforms, vertical and horizontal supports, fabricated accurately for anchorage to each other and to building structure.
   1. Regulatory Requirements: Provide stairs that comply with most stringent requirements of local, state, and federal regulations; where requirements of Contract Documents exceed those of regulations, comply with Contract Documents.
   2. Handrails: See section 05 7000.
   3. Structural Design: Provide complete stair assemblies that comply with the applicable local code.
      a. Stair Capacity: Uniform live load of 100 lb/sq ft (4.7 kPa) and a concentrated load of 300 lb (14.4 kg) with deflection of stringer or landing framing not to exceed [L/600] with a max. of 3/8 of span.
      b. Railing Assemblies: Comply with ASTM E985 and ASCE 7-16 requirements.
   4. Dimensions: As indicated on drawings.
   5. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
   6. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.
   7. Separate dissimilar metals using paint or permanent tape.

B. Metal Jointing and Finish Quality Levels:
   1. Architectural: All joints as inconspicuous as possible, whether welded or mechanical.
      a. Welded Joints: Continuously welded and ground smooth and flush.
      b. Mechanical Joints: Butted tight, flush, and hairline; concealed fastenings only.
      c. Exposed Edges and Corners: Eased to small uniform radius.

d. Metal Surfaces to be Painted: Sanded or ground smooth, suitable for highest quality gloss finish.

C. Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.

D. Anchors and Related Components: Same material and finish as item to be anchored, except where specifically indicated otherwise; provide all anchors and fasteners required.

2.02 METAL STAIRS WITH CONCRETE TREADS

A. Jointing and Finish Quality Level: Architectural, as defined above.

B. Risers: Closed.

C. Treads: Metal pan with field-installed concrete fill.
1. Concrete Depth: 1-1/2 inches (38 mm), minimum.
2. Tread Pan Material: Steel sheet.
3. Tread Pan Thickness: As required by design; 14 gauge, 0.075 inch (1.9 mm) minimum.
4. Concrete Reinforcement: Welded wire mesh.
5. Concrete Finish: For resilient floor covering.

D. Risers: Same material and thickness as tread pans.
1. Nosing Depth: Not more than 1-1/2 inch (38 mm) overhang.
2. Nosing Return: Flush with top of concrete fill, not more than 1/2 inch (12 mm) wide.

E. Stringers: Steel plate.
1. Stringer Depth: As required based on stair supplier engineered design.

F. Landings: Similar construction, using corrugated steel decking, supported and reinforced as required to achieve design load capacity.

G. Railings: See section 05 7000.

H. Finish: Shop- or factory-prime painted.

I. Under Side of Stair: Exposed to view, to be finished same as specified for other exposed to view surfaces.

2.03 MATERIALS

A. Steel Sections: ASTM A36/A36M.

B. Steel Plates: ASTM A6/A6M or ASTM A283/A283M.

C. Ungalvanized Steel Sheet: Hot- or cold-rolled, except use cold-rolled where finished work will be exposed to view.
1. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Designation CS (commercial steel).
2. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel).

D. Concrete Fill: See Section 03 3000.

2.04 ACCESSORIES

A. Steel Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, and galvanized to ASTM A153/A153M where connecting galvanized components.

B. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

C. Shop and Touch-Up Primer: SSPC-Paint 15, and comply with VOC limitations of authorities having jurisdiction.

2.05 SHOP FINISHING

A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

B. Do not prime surfaces in direct contact with concrete or where field welding is required.

C. Prime Painting: Use specified shop- and touch-up primer.
   1. Preparation of Steel: In accordance with SSPC-SP 2, Hand Tool Cleaning.
   2. Number of Coats: One.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. When field welding is required, clean and strip primed steel items to bare metal.

B. Supply items required to be cast into concrete and embedded in masonry with setting templates.

3.03 INSTALLATION

A. Install components plumb and level, accurately fitted, free from distortion or defects.

B. Provide anchors, plates, angles, and hangers required for connecting stairs to structure.

C. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

D. Provide welded field joints where specifically indicated on drawings. Perform field welding in accordance with AWS D1.1/D1.1M.

E. Other field joints may be either welded or bolted provided the result complies with the limitations specified for jointing quality levels.

F. Obtain approval prior to site cutting or creating adjustments not scheduled.

G. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

END OF SECTION

SECTION 05 5133 - METAL LADDERS

PART 1 GENERAL

1.01 SECTION INCLUDES

1.02 REFERENCE STANDARDS

A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

C. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.

D. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.

E. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).

F. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

G. SSPC-SP 2 - Hand Tool Cleaning; 1982, with Editorial Revision (2004).

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's data sheets on each ladder safety system product to be used, including installation instructions.

C. Shop Drawings:
   1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   2. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.

C. Mechanical Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.

D. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

E. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FABRICATED LADDERS

A. Ladders (Elevator Pit): Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish.
   1. Side Rails: 3/8 by 2 inches (9 by 50 mm) members spaced at 20 inches (500 mm).
   2. Rungs: One inch (25 mm) diameter solid round bar spaced 12 inches (300 mm) on center.
   3. Space rungs 7 inches (175 mm) from wall surface.

2.04 FINISHES - STEEL

A. Prime paint steel items.
   1. Do not prime surfaces in direct contact with concrete.
   2. Do not prime surfaces where field welding is required.

B. Prepare surfaces to be primed in accordance with SSPC-SP2.

C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

D. Prime Painting: One coat.

2.05 FABRICATION TOLERANCES

A. Squareness: 1/8 inch (3 mm) maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch (1.5 mm).

C. Maximum Misalignment of Adjacent Members: 1/16 inch (1.5 mm).

D. Maximum Bow: 1/8 inch (3 mm) in 48 inches (1.2 m).

E. Maximum Deviation From Plane: 1/16 inch (1.5 mm) in 48 inches (1.2 m).

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components as indicated on drawings.

D. Perform field welding in accordance with AWS D1.1/D1.1M.

E. Obtain approval prior to site cutting or making adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

C. Maximum Out-of-Position: 1/4 inch (6 mm).

END OF SECTION

SECTION 05 7000 - DECORATIVE METAL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Railing and guardrail assemblies.

1.02 RELATED REQUIREMENTS

A. Section 08 8000 - Glazing: Glass.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.

D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

E. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2017.

F. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2014 (Editorial 2017).

G. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.

H. ASTM A554 - Standard Specification for Welded Stainless Steel Mechanical Tubing; 2016.

I. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

J. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2016.

K. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2017.

L. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2013, with Editorial Revision.

M. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions; 2015a.

N. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).

O. AWS D1.6/D1.6M - Structural Welding Code - Stainless Steel; 2017.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Submit manufacturer's product data, including description of materials, components, finishes, fabrication details, glass, anchors, and accessories.

C. Shop Drawings: Indicate railing system elevations and sections, details of profile, dimensions, sizes, connection attachments, anchorage, size and type of fasteners, and accessories. Indicate anchor and joint locations, brazed connections, transitions, and terminations.

D. Test Reports: Submit test reports from an independent testing agency showing compliance with specified design and performance requirements.

E. Maintenance Data: Manufacturer's instructions for care and cleaning.

F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in installing decorative stairs and railing systems and acceptable to manufacturer.

B. Templates: Supply installation templates, reinforcing, and required anchorage devices.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in factory-provided protective coverings and packaging.

B. Protect materials against damage during transit, delivery, storage, and installation at site.

C. Inspect materials upon delivery for damage. Repair damage to be indistinguishable from undamaged areas; if damage cannot be repaired to be indistinguishable from undamaged parts and finishes, replace damaged items.

D. Prior to installation, store materials and components under cover in a dry location.

1.07 FIELD CONDITIONS

A. Do not install railings until project is enclosed and ambient temperature of space is minimum 65 degrees F (18.3 degrees C) and maximum 95 degrees F (35 degrees C).

B. Maintain ambient temperature of space at minimum 65 degrees F (18.3 degrees C) and maximum 95 degrees F (35 degrees C) for 24 hours before, during, and after railing installation.

1.08 WARRANTY

A. Warranty: Manufacturer's standard one year warranty against defects in materials, fabrication, finishes, and installation commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.01 RAILING SYSTEMS

A. Railing Systems - General: Factory- or shop-fabricated in design indicated, to suit specific project conditions, and for proper connection to building structure, and in largest practical sizes for delivery to site.
   1. Performance Requirements: Design and fabricate railings and anchorages to resist the following loads without failure, damage, or permanent set; loads do not need to be applied simultaneously.
      a. Lateral Force: 75 lb (333 N) minimum, at any point, when tested in accordance with ASTM E935.
      b. Distributed Load: 50 lb/ft (0.73 kN per m) minimum, applied in any direction at the top of the handrail, when tested in accordance with ASTM E935.
      c. Concentrated Loads on Intermediate Rails: 50 psf (0.22 kgs per sq m), minimum.
      d. Concentrated Load: 200 lbs (888 N) minimum, applied in any direction at any point along the handrail system, when tested in accordance with ASTM E935.
      e. Handrails: Comply with applicable accessibility requirements of ADA Standards.
   2. Assembly: Join lengths, seal open ends, and conceal exposed mounting bolts and nuts using slip-on non-weld mechanical fittings, flanges, escutcheons, and wall brackets.
   3. Joints: Tightly fitted and secured, machined smooth with hairline seams.
   4. Field Connections: Provide sleeves to accommodate site assembly and installation.
   5. Welded and Brazed Joints: Make visible joints butt tight, flush, and hairline; use methods that avoid discoloration and damage of finish; grind smooth, polish, and restore to required finish.
      a. Ease exposed edges to a small uniform radius.
      b. Welded Joints:
         1) Carbon Steel: Perform welding in accordance with AWS D1.1/D1.1M.
         2) Stainless Steel: Perform welding in accordance with AWS D1.6/D1.6M.

B. Glass Guiderail System:
   1. Basis of Design: CRL, C.R. Laurence Co, Inc: www.crlaurence.com.
      a. Base Shoe Profile: CRL Part # L56S, 9BL56; 2-7/8 inches (73 mm) wide by 4-3/4 inches (120.7 mm) high rectangular cross-section. Designed to work with CRL's TAPER-LOC Dry Glazed System with 9/16 inch (14.29 mm) fully tempered glass with laminated PVB.
      b. Cladding: BSCB10 brushed stainless steel.
      c. Profile: Part # GRLC10, crisp corner low profile 11 gauge u-channel 1-5/16 inches (33.3 mm) high. Brushed stainless steel.
      d. Provide all components, pieces, engineering, as required for complete installation.
   2. Handrail:
      a. Profile: Part # HR15, round 1-1/2 inches (38.1 mm) diameter.
      b. Material: Stainless steel.
      c. Finish: Brushed.
      d. Handrail Brackets: mounted to glass or wall (see drawings). Finish: Brushed stainless steel.
      e. Finish: Brushed stainless steel.
   3. Glass <TEMP GL-2>: 9/16 inch (14.29 mm) fully tempered glass with laminated PVB.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Steel Components:
   1. Sections, Shapes, Plate and Bar: ASTM A36/A36M.
   2. Tubing: ASTM A501/A501M structural tubing, round and shapes as indicated.

3. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
4. Ungalvanized Steel Sheet: Hot- or cold-rolled, except use cold-rolled where finished work will be exposed to view.
    a. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Designation CS (commercial steel).
    b. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel).
5. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, and galvanized to ASTM A153/A153M where connecting galvanized components.
6. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

B. Stainless Steel Components:
1. ASTM A666, Type 304.
2. Stainless Steel Tubing: ASTM A554, Type 304, 16 gauge, 0.0625 inch (1.59 mm) minimum metal thickness, 1-1/2 inch (38 mm) diameter.
3. Stainless Steel Bars, Shapes and Moldings: ASTM A276/A276M, Type 304.
4. Stainless Steel Finish: Brushed.

2.03 ACCESSORIES

A. Welding Fittings: Factory- or shop-welded from matching pipe or tube; joints and seams ground smooth.

B. Anchors and Fasteners: Provide anchors and other materials as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
1. For anchorage to concrete, provide inserts to be cast into concrete for bolt anchors.
2. For anchorage to masonry, provide brackets to be embedded in masonry for bolt anchors.
3. For anchorage to stud walls, provide backing plates for bolt anchors.
4. Exposed Fasteners: No exposed bolts or screws.

C. Carbon Steel Bolts and Nuts: ASTM A307.

D. Bituminous Coating: Cold-applied asphalt mastic, noncorrosive compound free of asbestos, sulfur, and other deleterious impurities; 0.015 inch (0.4 mm) dry film thickness per coat.

E. Finish Touch-Up Materials: As recommended by manufacturer for field application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate and site conditions are acceptable and ready to receive work.

B. Verify field dimensions of locations and areas to receive work.

C. Notify Architect immediately of conditions that would prevent satisfactory installation.

D. Do not proceed with work until detrimental conditions have been corrected.

E. Furnish components to be installed in other work to installer of that other work, including but not limited to blocking, sleeves, inserts, anchor bolts, embedded plates, and supports for attachment of anchors.

3.02 PREPARATION

A. Review installation drawings before beginning installation. Coordinate diagrams, templates, instructions, and directions for installation of anchorages and fasteners.

B. Clean surfaces to receive units. Remove materials and substances detrimental to the installation.

3.03 INSTALLATION

A. Comply with manufacturer's drawings and written instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects, and with tight joints, except where necessary for expansion.

C. Anchor securely to structure.

D. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

E. Isolate dissimilar materials with bituminous coating, bushings, grommets, or washers to prevent electrolytic corrosion.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per floor level, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

C. Maximum Out-of-Position: 1/4 inch (6 mm).

3.05 CLEANING

A. Remove protective film from exposed metal surfaces.

B. Metal: Clean exposed metal finishes with potable water and mild detergent, in accordance with manufacturer recommendations; do not use abrasive materials or chemicals, detergents, or other substances that may damage the material or finish.

3.06 PROTECTION

A. Protect installed components and finishes from damage after installation.

B. Repair damage to exposed finishes to be indistinguishable from undamaged areas.
   1. If damage to finishes and components cannot be repaired to be indistinguishable from undamaged finishes and components, replace damaged items.

END OF SECTION

SECTION 06 1000 - ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sheathing.

B. Roof-mounted curbs.

C. Roofing nailers.

D. Preservative treated wood materials.

E. Concealed wood blocking, nailers, and supports.

1.02 RELATED REQUIREMENTS

A. Section 07 6200 - Sheet Metal Flashing and Trim: Sill flashings.

B. Section 09 2116 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

B. AWPA U1 - Use Category System: User Specification for Treated Wood; 2017.

C. PS 1 - Structural Plywood; 2009.

D. PS 20 - American Softwood Lumber Standard; 2015.

E. SPIB (GR) - Grading Rules; 2014.

1.04 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Provide sustainably harvested wood; see Section 01 6000 - Product Requirements for requirements.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring <WD BLKG>:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

2.03 CONSTRUCTION PANELS

A. Wall Sheathing: Plywood, PS 1, Grade C-D, Exposure I.
   1. <WD SHTG-30>: 1/2 inch.
   2. <WD SHTG-30F>: 1/2 inch; fire retardant treated.
   3. <WD SHTG-31>: 5/8 inch.
   4. <WD SHTG-31F>: 5/8 inch fire retardant treated.
   5. <WD SHTG-32>: 3/4 inch.
   6. <WD SHTG-32F>: 3/4 inch fire retardant treated.

B. Other Applications:
   1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
   2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
   3. Other Locations: PS 1, C-D Plugged or better.

2.04 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
   2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.

B. Sill Gasket on Top of Foundation Wall: 1/4 inch (6 mm) thick, plate width, closed cell plastic foam from continuous rolls.

C. Sill Flashing: As specified in Section 07 6200.

2.05 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Preservative Treatment:
   1. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A.
      a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.

2. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F.
    a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
3. Preservative Pressure Treatment of Lumber in Contact with Soil: AWPA U1, Use Category UC4A, Commodity Specification A.
    a. Preservative for Field Application to Cut Surfaces: As recommended by manufacturer of factory treatment chemicals for brush-application in the field.

PART 3 EXECUTION

3.01 PREPARATION

A. Where wood framing bears on cementitious foundations, install full width sill flashing continuous over top of foundation, lap ends of flashing minimum of 4 inches (100 mm) and seal.

B. Install sill gasket under sill plate of framed walls bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.

C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

3.04 INSTALLATION OF CONSTRUCTION PANELS

A. Wall Sheathing: Secure with long dimension in the most efficient direction to wall studs, with ends over firm bearing and staggered, using nails or screws.

3.05 CLEANING

A. Waste Disposal: Comply with the requirements of Section 01 7419 - Construction Waste Management and Disposal.
    1. Comply with applicable regulations.
    2. Do not burn scrap on project site.
    3. Do not burn scraps that have been pressure treated.

4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or "waste-to-energy" facilities.

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 06 2000 - FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finish carpentry items.

1.02 RELATED REQUIREMENTS

A. Section 09 9123 - Interior Painting: Painting of finish carpentry items.

B. Section 09 9300 - Staining and Transparent Finishing: Staining and transparent finishing of finish carpentry items.

1.03 REFERENCE STANDARDS

A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014, with Errata (2016).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Samples: Submit two samples of finish plywood, 6 by 6 inch (152 by 152 mm) in size illustrating wood grain and specified finish.

C. Samples: Submit two samples of wood trim 6 inch (152 mm) long.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS), unless noted otherwise.

2.02 WOOD-BASED COMPONENTS

A. Provide sustainably harvested wood, certified or labeled as specified in Section 01 6000 - Product Requirements.

B. Provide composite wood containing no added formaldehyde. See Section 01 6116.

2.03 LUMBER MATERIALS

A. Hardwood Lumber <WDT-1>: Maple species, plain sawn, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.

2.04 FASTENINGS

A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.

B. Adhesive for factory-fabricated units: Manufacturer's recommended adhesive for application.

2.05 ACCESSORIES

A. Primer: Alkyd primer sealer.

B. Wood Filler: Solvent base, tinted to match surface finish color.

2.06 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.

B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

3.02 INSTALLATION

A. Install custom fabrications in accordance with AWI/AWMAC/WI (AWS) requirements for grade indicated.

B. Set and secure materials and components in place, plumb and level.

C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch (0.79 mm). Do not use additional overlay trim to conceal larger gaps.

D. Install components with finish nails, unless noted otherwise.

3.03 PREPARATION FOR SITE FINISHING

A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

B. Site Finishing: See Section 09 9123 and 09 9300.

C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.04 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch (1.6 mm).

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch (0.79 mm).

END OF SECTION

SECTION 06 4100 - ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Specially fabricated cabinet units.

B. Hardware.

1.02 RELATED REQUIREMENTS

A. Section 12 3600 - Countertops.

1.03 REFERENCE STANDARDS

A. BHMA A156.9 - American National Standard for Cabinet Hardware; 2015.

B. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
   1. Scale of Drawings: 1-1/2 inch to 1 foot (125 mm to 1 m), minimum.

C. Product Data: Provide data for hardware accessories.

D. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches (300 mm) square, illustrating proposed cabinet substrate and finish.

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect units from moisture damage.

1.07 FIELD CONDITIONS

A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 CABINETS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS), unless noted otherwise.

B. Plastic Laminated Faced Cabinets:

1. Basis of Design: Wilsonart: www.wilsonart.com.
    a. <PLAM-#>: See drawings for product information.
2. Finish - Exposed Exterior Surfaces: Decorative laminate.
3. Finish - Exposed Interior Surfaces: Decorative laminate.
4. Finish - Semi-Exposed Surfaces: Decorative laminate
5. Finish - Concealed Surfaces: Manufacturer's option.
6. Door and Drawer Front Edge Profiles: Square edge with thick applied band.
7. Casework Construction Type: Type A - Frameless.
8. Interface Style for Cabinet and Door: Style 1 - Overlay; flush overlay.
9. Layout for Cabinet and Door Fronts: Flush panel.
10. Adjustable Shelf Loading: 50 lbs. per sq. ft.
    a. Deflection: L/144.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

B. Provide sustainably harvested wood, certified or labeled as specified in Section 01 6000.

C. Provide composite wood containing no added formaldehyde. See Section 01 6116.

2.03 LAMINATE MATERIALS

A. Manufacturers:
1. Formica Corporation: www.formica.com.
2. Panolam Industries International, Inc: www.panolam.com/#sle.
3. Wilsonart LLC: www.wilsonart.com/#sle.
4. Substitutions: See Section 01 6000 - Product Requirements.

B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.

C. Provide specific types as follows:
1. Horizontal Surfaces: HGS, 0.048 inch (1.22 mm) nominal thickness.
2. Vertical Surfaces: VGS, 0.028 inch (0.71 mm) nominal thickness.
3. Cabinet Liner: CLS, 0.020 inch (0.51 mm) nominal thickness.
4. Laminate Backer: BKL, 0.020 inch (0.51 mm) nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.

2.04 COUNTERTOPS

A. Countertops are specified in Section 12 3600.

2.05 ACCESSORIES

A. Adhesive: Type recommended by fabricator to suit application.

B. Plastic Edge Banding: Extruded 3 mm PVC, flat shaped; smooth finish; of width to match component thickness.
1. Color: As selected by Architect from manufacturer's standard range.

C. Fasteners: Size and type to suit application.

D. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.

E. Grommets: Standard plastic grommets for cut-outs, in color to match adjacent surface.
   1. Provide one grommet for every 5 linear feet of countertop (excluding toilet rooms), unless noted otherwise. Coordinate locations with Architect/Owner.

2.06 HARDWARE

A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.

B. Adjustable Shelf Supports: Standard side-mounted system using recessed metal shelf standards or multiple holes for pin supports and coordinated self rests, polished chrome finish, for nominal 1 inch (25 mm) spacing adjustments.

C. Drawer and Door Pulls: Slender profile:
   1. Basis of Design: Mockett DP252 Series: www.mockett.com.
   2. Color: Matte Black, or approved equal.

D. Drawer Slides:
   1. Type: Full extension with overtravel.
   2. Static Load Capacity: Heavy Duty grade.
   3. Mounting: Side mounted.
   4. Stops: Integral type.
   5. Features: Provide self closing/stay closed type.
   6. Manufacturers:
      a. Accuride International, Inc: www.accuride.com.
      b. Grass America Inc: www.grassusa.com/#sle.
      c. Hettich America, LP: www.hettich.com/sle.
      d. Knape & Vogt Manufacturing Company: www.knapeandvogt.com.
      e. Substitutions: See Section 01 6000 - Product Requirements.

E. Hinges: European style concealed self-closing type, steel with nickel-plated finish.
   1. Manufacturers:
      a. Blum, Inc: www.blum.com/#sle.
      b. Grass America Inc: www.grassusa.com/#sle.
      c. Hardware Resources: www.hardwareresources.com.
      d. Hettich America, LP: www.hettich.com/sle.
      e. Substitutions: See Section 01 6000 - Product Requirements.

F. Lazy Susan Hardware: Pie cut style. Two shelf; adjustable, white polymer. Telescoping adjustable shaft and mounting hardware, as required.

G. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed. Finish to match cabinet pulls.

H. Hanging File Rails: 16 gauge x ¾ inch aluminum bar stock supports with covers.

I. Display Case Door Hardware:
   1. Sliding door assembly basis of design: Knape and Vogt KVM-P992ZC72, or approved equal.
   2. Door lock: Keyed cylinder, two keys per lock, master keyed.

2.07 FABRICATION

A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

C. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet (600 mm) from sink cut-outs.
   1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.

D. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

A. Install work in accordance with AWI/AWMAC/WI (AWS) requirements for grade indicated.

B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.

C. Use fixture attachments in concealed locations for wall mounted components.

D. Use concealed joint fasteners to align and secure adjoining cabinet units.

E. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch (0.79 mm). Do not use additional overlay trim for this purpose.

F. Secure cabinets to floor using appropriate angles and anchorages.

G. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.03 ADJUSTING

A. Adjust installed work.

B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

SECTION 06 8316 - FIBERGLASS REINFORCED PANELING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fiberglass reinforced plastic panels.

B. Trim.

1.02 REFERENCE STANDARDS

A. ASTM D2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of Barcol Impressor; 2013a.

B. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2016.

C. ASTM D5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels; 2017.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

E. FDA Food Code - Chapter 6 - Physical Facilities; Current Edition.

F. FM 4880 - Approval Standard for Class 1 Fire Rating of Building Panrels or Interior Finish Materials; 2015.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

C. Samples: Submit two samples 6 by 6 inch (150 by 150 mm) in size illustrating material and surface design of panels.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store panels flat, indoors, on a clean, dry surface. Remove packaging and allow panels to acclimate to room temperature for 48 hours prior to installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fiberglass Reinforced Plastic Panels:
   1. Crane Composites, Inc: www.cranecomposites.com/#sle.
   2. Marlite, Inc: www.marlite.com/#sle.
   3. Nudo Products, Inc: www.nudo.com/#sle.
   4. Substitutions: See Section 01 6000 - Product Requirements.
   5. Inpro Architectural Products: www.inprocorp.com.

2.02 PANEL SYSTEMS

A. Wall Panels <FRP-1>:
   1. Panel Size: 4 by 8 feet (1.2 by 2.4 m).
   2. Panel Thickness: 0.10 inch (2.5 mm).
   3. Surface Design: Embossed.
   4. Color: Inpro; Designer White #0101: www.inprocorp.com.
   5. Attachment Method: Adhesive only, with trim and sealant in joints.

2.03 MATERIALS

A. Panels: Fiberglass reinforced plastic (FRP), complying with ASTM D5319.
   1. Surface Burning Characteristics: Maximum flame spread index of 25 and smoke developed index of 450; when system tested in accordance with ASTM E84.
   2. Class 1 fire rated when tested in accordance with FM 4880.
   3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   4. Scratch Resistance: Barcol hardness score greater than 35, when tested in accordance with ASTM D2583.
   5. Surface Characteristics and Cleanability: Provide products that are smooth, durable, and easily cleanable, in compliance with FDA Food Code, Chapter 6 - Physical Facilities.

B. Trim: Vinyl; color coordinating with panel.

C. Adhesive: Type recommended by panel manufacturer.

D. Sealant: Type recommended by panel manufacturer; white.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions and substrate flatness before starting work.

B. Verify that substrate conditions are ready to receive the work of this section.

3.02 INSTALLATION - WALLS

A. Install panels in accordance with manufacturer's instructions.

B. Cut and drill panels with carbide tipped saw blades, drill bits, or snips.

C. Apply adhesive to the back side of the panel using trowel as recommended by adhesive manufacturer.

D. Apply panels to wall with seams plumb and pattern aligned with adjoining panels.

E. Install panels with manufacturer's recommended gap for panel field and corner joints.

F. Place trim on panel before fastening edges, as required.

G. Fill channels in trim with sealant before attaching to panel.

H. Install trim with adhesive and screws or nails, as required.

I. Seal gaps at floor, ceiling, and between panels with applicable sealant to prevent moisture intrusion.

J. Remove excess sealant after paneling is installed and prior to curing.

END OF SECTION

SECTION 07 1300 - SHEET WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sheet Waterproofing:
   1. Self-adhered modified bituminous sheet membrane.
   2. Self-adhered HDPE sheet membrane.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete substrate.

B. Section 07 2100 - Thermal Insulation: Insulation used for protective cover.

1.03 REFERENCE STANDARDS

A. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016.

B. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 1998 (Reapproved 2010).

C. ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting; 2012.

D. ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds; 1998 (Reapproved 2010).

E. ASTM D1876 - Standard Test Method for Peel Resistance of Adhesives (T-Peel Test); 2008 (Reapproved 2015).

F. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2017.

G. ASTM D5295/D5295M - Standard Guide for Preparation of Concrete Surfaces for Adhered (Bonded) Membrane Waterproofing Systems; 2014.

H. ASTM D5385/D5385M - Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes; 1993, with Editorial Revision (2014).

I. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.

J. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover; 2008a, with Editorial Revision (2013).

K. NRCA (WM) - The NRCA Waterproofing Manual; 2005.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for membrane, surface conditioner, flexible flashings, and joint and crack sealants.

C. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.

D. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Membrane Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Contractor shall correct defective Work within a five year period after Date of Substantial Completion; remove and replace materials concealing waterproofing at no extra cost to Owner.

C. Provide five year manufacturer warranty for waterproofing failing to resist penetration of water, except where such failures are the result of structural failures of building. Hairline cracking of concrete due to temperature change or shrinkage is not considered a structural failure.

PART 2 PRODUCTS

2.01 MEMBRANE MATERIALS

A. Self-Adhered Modified Bituminous Sheet Membrane <WTR PRF-1>:
   1. Thickness: 60 mil, 0.060 inch (1.5 mm), minimum.
   2. Tensile Strength:
      a. Film: 5,000 psi (34.57 MPa), minimum, measured in accordance with ASTM D882 and at grip-separation rate of 2 inches (50 mm) per minute.
      b. Membrane: 325 psi (2.24 MPa), minimum, measured in accordance with ASTM D412 Method A, using die C and at spindle-separation rate of 2 inches (50 mm) per minute.
   3. Elongation at Break: 300 percent, minimum, measured in accordance with ASTM D412.
   4. Water Vapor Permeance: 0.05 perm (2.9 ng/(Pa s sq m)), maximum, measured in accordance with ASTM E96/E96M.
   5. Low Temperature Flexibility: Unaffected when tested in accordance with ASTM D1970/D1970M at minus 20 degrees F (minus 11 C), 180 degree bend on 1 inch (25 mm) mandrel.
      a. Provide low temperature versions of products listed below as required.
   6. Peel Strength: 7 lb per inch (1226 N/m), minimum, when tested in accordance with ASTM D903.
   7. Lap Adhesion Strength: 5 lb per inch (875.6 N/m), minimum, when tested in accordance with ASTM D1876.
   8. Puncture Resistance: 50 lb (22.67 kg), minimum, measured in accordance with ASTM E154/E154M.
   9. Water Absorption: 0.1 percent increase in weight, maximum, measured in accordance with ASTM D570, 24 hour immersion.
   10. Hydrostatic Resistance: Resists the weight of 200 ft (61 m) when tested in accordance with ASTM D5385/D5385M.
   11. Adhesives, Sealants, Tapes, and Accessories: As recommended by membrane manufacturer.
   12. Basis of Design Products:
      a. Carlisle Coatings & Waterproofing Inc; MiraDRI 860/861: www.carlisleccw.com/#sle.
      b. GCP Applied Technologies; Bituthene 3000: www.gcpat.com.

c. W.R. Meadows, Inc; MEL-ROL: www.wrmeadows.com/#sle.
d. Substitutions: See Section 01 6000 - Product Requirements.

B. Self-Adhered HDPE Sheet Membrane <WTR PRF-2>: Recommended by manufacturer for placement below concrete slabs and on outside face of below grade walls before placement of concrete.
1. Sheet Thickness: 46 mil (0.046 inch) (1.2 mm), minimum.
2. Low Temperature Flexibility: Unaffected when tested in accordance with ASTM D1970/D1970M at minus 20 degrees F (minus 11 C), 180 degree bend on 1 inch (25 mm) mandrel.
a. Provide low temperature versions of products listed below as required.
3. Hydrostatic Pressure Resistance: Resists pressure of 231 ft (70 m) head of water, when tested in accordance with ASTM D5385/D5385M.
4. Elongation at Break: 500 percent, minimum, measured in accordance with ASTM D412.
5. Tensile Strength, Film: 3,500 psi (24 MPa), minimum, measured in accordance with ASTM D412.
6. Lap Peel Adhesion: 8 lb per inch (1,408 N/m), minimum, when tested in accordance with ASTM D1876.
7. Water Vapor Permeance: 0.01 perm (0.6 ng/(Pa s sq m)), maximum, measured in accordance with ASTM E96/E96M.
8. Bond to Concrete: 5 lb per inch (875 N/m), minimum, measured in accordance with ASTM D903.
9. Lateral Water Migration Resistance: Resists pressure of 231 ft (70 m) head of water, when tested in accordance with ASTM D5385/D5385M.
10. Adhesives, Sealants, Tapes, and Accessories: As recommended by membrane manufacturer.
11. Basis of Design Products:
a. Carlisle Coatings & Waterproofing Incorporated; MiraPLY-H: www.carlisle-ccw.com.
b. GCP Applied Technologies; Preprufe 300R Plus: www.gcpat.com/#sle.
c. W.R. Meadows, Inc; PRECON: www.wrmeadows.com.
d. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ACCESSORIES

A. Sealant for Cracks and Joints In Substrates: Resilient elastomeric joint sealant compatible with substrates and waterproofing materials.

B. Protection Board: Rigid insulation as specified in Section 07 2100.

C. Drainage Panel <DRAIN BD-1>: Drainage layer with geotextile filter fabric on earth side.
1. Also provide at locations where <INSUL-1> is not installed over <WTR PRF-1>.
2. Composition: Dimpled polystyrene, polyethylene, or polypropylene core; polypropylene filter fabric.
3. Basis of Design Products:
a. Grace Construction Products; Hydroduct 200: www.na.graceconstruction.com.
b. Carlisle Coatings & Waterproofing Incorporated; MiraDRAIN 2000: www.carlisle-ccw.com.
c. W.R. Meadows, Inc; Mel-Drain: www.wrmeadows.com/#sle.
d. Substitutions: See Section 01 6000 - Product Requirements.

D. Flexible Flashings: Type recommended by membrane manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions are acceptable prior to starting this work.

B. Verify substrate surfaces are durable; free of matter detrimental to adhesion or application of waterproofing system.

C. Verify items that penetrate surfaces to receive waterproofing are securely installed.

3.02 PREPARATION

A. Protect adjacent surfaces from damage not designated to receive waterproofing.

B. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions; vacuum substrate clean.

C. Do not apply waterproofing to surfaces unacceptable to membrane manufacturer.

D. Fill non-moving joints and cracks with a filler compatible with waterproofing materials.

E. Seal moving cracks with sealant and non-rigid filler, using procedures recommended by sealant and waterproofing manufacturers.

F. Surfaces for Adhesive Bonding: Apply surface conditioner at a rate recommended by manufacturer, and protect conditioner from rain or frost until dry.

G. Concrete Surfaces for Adhesive Bonding: Prepare concrete substrate according to ASTM D5295/D5295M.
   1. Remove substances that inhibit adhesion including form release agents, curing compounds admixtures, laitance, moisture, dust, dirt, grease and oil.
   2. Repair surface defects including honeycombs, fins, tie holes, bug holes, sharp offsets, rutted cracks, ragged corners, deviations in surface plane, spalling and delaminations, as described in the reference standard.
   3. Remove and replace areas of defective concrete as specified in Section 03 3000.
   4. Prepare concrete for adhesive bonded waterproofing using mechanical or chemical methods described in the referenced standard.
   5. Test concrete surfaces as described in the referenced standards. Verify surfaces are ready to receive adhesive bonded waterproofing membrane system.

3.03 INSTALLATION - MEMBRANE

A. Install membrane waterproofing in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.

B. Roll out membrane, and minimize wrinkles and bubbles.

C. Self-Adhering Membrane: Remove release paper layer, and roll out onto substrate with a mechanical roller to provide full contact bond.

D. Overlap edges and ends, minimum 3 inches (76 mm), seal permanently waterproof by method recommended by manufacturer, and apply uniform bead of sealant to joint edge.

E. Reinforce membrane with multiple thickness of membrane material over joints, whether joints are static or dynamic.

F. Weather lap joints on sloped substrate in direction of drainage, and seal joints and seams.

G. Flexible Flashings: Seal items watertight that penetrate through waterproofing membrane with flexible flashings.

H. Seal membrane and flashings to adjoining surfaces.
   1. Install termination bar along edges.

3.04 INSTALLATION - DRAINAGE PANEL

A. Place drainage panel directly against membrane, butt joints, place to encourage drainage downward. Scribe and cut boards around projections, penetrations, and interruptions.

B. Adhere protection board to substrate with compatible adhesive.

3.05 PROTECTION

A. Do not permit traffic over unprotected or uncovered membrane.

END OF SECTION

SECTION 07 2100 - THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation at cavity wall construction and exterior wall behind exterior wall finish.

B. Batt insulation in exterior wall, ceiling, and roof construction.

C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.02 RELATED REQUIREMENTS

A. Section 07 2500 - Weather Barriers: Separate air barrier and vapor retarder materials.

B. Section 07 8400 - Firestopping: Insulation as part of fire-rated through-penetration assemblies.

C. Section 09 2116 - Gypsum Board Assemblies: Acoustic insulation inside walls and partitions.

1.03 REFERENCE STANDARDS

A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2017.

B. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2013.

C. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

C. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

D. Sustainability Design Documentation: Provide applicable sustainability documentation for each product as described in Section 01 3329 - Sustainable Design Requirements.

1.05 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 SUSTAINABILITY

A. Products listed as Basis of Design have been selected using sustainability criteria. Products from other manufacturer's listed herein, and/or substitutions will only be accepted if they meet, or exceed, the performance of the Basis of Design. Manufacturer must be able to provide sustainability documentation showing that the product meets, or exceeds, the Basis of Design. Examples of acceptable documentation include:
   1. Environmental Product Declaration (EPD).
   2. Health Product Declaration (HPD).
   3. Declare Label.
   4. Living Building Challenge Red List Free.
   5. Living Building Challenge Red List Approved.
   6. Other documentation illustrating that the proposed product meets, or exceeds, the Basis of Design performance will be considered by the Architect.

2.02 FIBERBOARD INSULATION MATERIALS

A. Mineral Fiberboard Insulation: Rigid or semi-rigid mineral fiber, ASTM C612 or ASTM C553; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
   1. Provide foil facing on one side for <INSUL-25>; with flame spread index of 25 or less, when tested in accordance with ASTM E84.
   2. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
   3. Thermal Resistance: R-value (RSI-value) of 4.2 (0.74) per inch at 75 degrees F (24 C), minimum, when tested according to ASTM C518.
   4. Maximum Density: 8.0 pounds per cubic foot (128 kg/cu m), nominal.
   5. Sustainability Requirements: Manufacturer's must be able to provide the following, or equivalent, product documentations:
      a. Environmental Product Declaration (EPD) or Declare Label.
      b. Living Building Challenge Red List Free or Compliant.
   6. <INSUL-25> Basis of Design: Thermafiber, Inc; FireSpan: www.thermafiber.com/#sle.
   7. <INSUL-26> Basis of Design: Thermafiber, Inc; RainBarrier: www.thermafiber.com/#sle.
   8. Other Acceptable Products provided they meet or exceed the Basis of Design performance, including sustainability requirements:
      a. ROCKWOOL (ROXUL, Inc); CURTAINROCK 80: www.rockwool.com/#sle.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.03 ACCESSORIES

A. Sheet Vapor Retarder: Specified in Section 07 2500.

B. Tape joints of rigid insulation in accordance with roofing and insulation manufacturers' instructions.

C. Insulation Fasteners: Appropriate for purpose intended.

D. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT EXTERIOR WALLS

A. Install boards vertically on walls.
   1. Butt edges and ends tightly to adjacent boards and protrusions.

B. Extend boards over expansion joints, unbonded to wall on one side of joint.

C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 BOARD INSTALLATION AT CAVITY WALLS

A. Install boards to fit snugly between wall ties.

B. Install boards horizontally on walls.

C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.04 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 07 2119 - FOAMED-IN-PLACE INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Foamed-in-place insulation.

1.02 REFERENCE STANDARDS

A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2017.

B. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2012.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

D. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.

E. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials; 2013.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide product description, insulation properties, and preparation requirements.

C. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than three years of experience.

B. Applicator Qualifications: Company specializing in performing work of the type specified, with minimum three years experience.

1.05 FIELD CONDITIONS

A. Do not apply foam when temperature is below that specified by the manufacturer for ambient air and substrate.

B. Do not apply foam when temperature is within 5 degrees F (2.78 degrees C) of dew point.

PART 2 PRODUCTS

2.01 MATERIALS

A. Foamed-In-Place Insulation <INSUL-36>: Medium-density, rigid or semi-rigid, closed cell polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.
   1. Thermal Resistance: R-value (RSI-value) of 6.6 (1.2), minimum, per 1 inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature when tested in accordance with ASTM C518.

2. Water Vapor Permeance: Vapor retarder; 2 perms (115 ng/(Pa s sq m)), maximum, when tested at intended thickness in accordance with ASTM E96/E96M, desiccant method.
3. Water Absorption: Less than 2 percent by volume, maximum, when tested in accordance with ASTM D2842.
4. Air Permeance: 0.04 cfm per square foot (0.2 L/(s/sq m)), maximum, when tested at intended thickness in accordance with ASTM E2178 at 1.57 psf (75 Pa).
5. Closed Cell Content: At least 90 percent.
6. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.
7. Manufacturers:
    a. BASF Corporation; SPRAYTITE 81206: www.spf.basf.com/#sle.
    b. Henry Company; PERMAX 2.0: www.henry.com/#sle.
    c. Icynene-Lapolla; Icynene ProSeal: www.icynene.com/#sle.
    d. Johns Manville; JM Corbond III Closed Cell Spray Polyurethane Foam: www.jm.com/#sle.
    e. Rhino Linings Corporation; ThermalGuard CC2: www.rhinolinings.com/#sle.
8. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ACCESSORIES

A. Primer: As required by insulation manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify work within construction spaces or crevices is complete prior to insulation application.

B. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation adhesion.

3.02 PREPARATION

A. Mask and protect adjacent surfaces from over spray or dusting.

B. Apply primer in accordance with manufacturer's instructions.

3.03 APPLICATION

A. Apply insulation in accordance with manufacturer's instructions.

B. Apply insulation by spray method, to a uniform monolithic density without voids.

C. Patch damaged areas.

D. Where applied to voids and gaps assure space for expansion to avoid pressure on adjacent materials that may bind operable parts.

3.04 PROTECTION

A. Do not permit subsequent construction work to disturb applied insulation.

END OF SECTION

SECTION 07 2500 - WEATHER BARRIERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Vapor Retarders: Materials to make exterior walls, joints between exterior walls and roof, and joints around frames of openings in exterior walls water vapor resistant and air tight.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Vapor retarder under concrete slabs on grade.

B. Section 07 5300 - Elastomeric Membrane Roofing: Vapor retarder installed as part of roofing system.

C. Section 07 6200 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with weather barriers.

D. Section 07 9200 - Joint Sealants: Sealing building expansion joints.

1.03 DEFINITIONS

A. Weather Barrier: Assemblies that form either water-resistive barriers, air barriers, or vapor retarders.

B. Vapor Retarder: Air tight barrier made of material that is relatively water vapor impermeable, to the degree specified, with sealed seams and with sealed joints to adjacent surfaces.
   1. Water Vapor Permeance: For purposes of conversion, 57.2 ng/(Pa s sq m) = 1 perm.

1.04 REFERENCE STANDARDS

A. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2017.

B. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on material characteristics, performance criteria, and limitations.

C. Shop Drawings: Provide drawings of special joint conditions.

D. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.

1.06 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.

PART 2 PRODUCTS

2.01 VAPOR RETARDER MATERIALS (AIR BARRIER AND WATER-RESISTIVE)

A. <VPR RET-10>: Contractor's option to provide a self-adhesive or liquid applied membrane as described in the following paragraphs.

B. Vapor Retarder Sheet <VPR RET-10>: ASTM D1970/D1970M.
   1. Thickness: 40 mil, 0.040 inch (1.016 mm), nominal.
   2. Water Vapor Permeance: 0.05 perm (2.87 ng/(Pa s sq m)), maximum, when tested in accordance with ASTM E96/E96M.
   3. Seam and Perimeter Tape: As recommended by sheet manufacturer.
   4. Manufacturers:
      a. Carlisle Coatings and Waterproofing, Inc; Fire Resist 705FR-A: www.carlisleccw.com/#sle.
      b. Henry Company; Blueskin SA LT (low temp): www.henry.com/#sle.
      c. W.R. Meadows, Inc; Air-Shield Low Temp: www.wrmeadows.com/#sle.
      d. GCP Applied Technologies; Perm-A-Barrier Low Temperature Wall Membrane: www.gcpat.com.
      e. Substitutions: See Section 01 6000 - Product Requirements.

C. Vapor Retarder Coating <VPR RET-10>: Liquid applied, resilient, UV-resistant coating and associated joint treatment.
   1. Water Vapor Permeance: 1.0 perm (57 ng/(Pa s sq m)), maximum, when tested in accordance with ASTM E96/E96M.
   2. Suitable for use on concrete, masonry, plywood and gypsum sheathing.
   3. Joint Preparation Treatment: Coating manufacturer's recommended method, either tape or reinforcing mesh saturated with coating material.
   4. Manufacturers:
      a. Carlisle Coatings and Waterproofing, Inc; Fire Resist Barritech NP-LT: www.carlisleccw.com/#sle.
      b. Henry Company; Air-Bloc 32MR: www.henry.com/#sle.
      c. W.R. Meadows, Inc; Air-Shield LSR: www.wrmeadows.com/#sle.
      d. GCP Applied Technologies; Perm-A-Barrier NPL 10 LT: www.gcpat.com.
      e. Substitutions: See Section 01 6000 - Product Requirements.
   5. Joint Filler: As recommended by coating manufacturer and suitable to the substrate.

2.02 ACCESSORIES

A. Sealants, Tapes, and Accessories for Sealing Weather Barrier and Sealing Weather Barrier to Adjacent Substrates: As specified or as recommended by weather barrier manufacturer.

B. Flexible Flashing: Self-adhesive sheet flashing complying with ASTM D1970/D1970M, except slip resistance requirement is waived if not installed on a roof.
   1. Composition: Any material that meets physical requirements of ASTM D1970/D1970M with exceptions indicated.
   2. Thickness: 30 mil, 0.030 inch (0.76 mm), nominal; exception from ASTM D1970/D1970M.
   3. All flashing materials shall be compatible with, and approved by, the membrane manufacturer.

C. Thinners and Cleaners: As recommended by material manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and conditions are ready to accept the work of this section.

3.02 PREPARATION

A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

B. Clean and prime substrate surfaces to receive adhesives and sealants in accordance with manufacturer's instructions.

3.03 INSTALLATION

A. Install materials in accordance with manufacturer's instructions.

B. Vapor Retarders: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.

C. Apply sealants and adhesives within recommended application temperature ranges. Consult manufacturer if temperature is out of this range.

D. Self-Adhered Sheets:
   1. Prepare substrate in manner recommended by sheet manufacturer; fill and tape joints in substrate and between dissimilar materials.
   2. Lap sheets shingle-fashion to shed water and seal laps air tight.
   3. Once sheets are in place, press firmly into substrate with resilient hand roller; ensure that laps are firmly adhered with no gaps or fishmouths.
   4. Use same material, or other material approved by sheet manufacturer for the purpose, to seal to adjacent construction and as flashing.
   5. At wide joints, provide extra flexible membrane allowing joint movement.

E. Coatings:
   1. Prepare substrate in manner recommended by coating manufacturer; treat joints in substrate and between dissimilar materials as recommended by manufacturer.
   2. Where exterior masonry veneer is to be installed, install masonry anchors before installing weather barrier over masonry; seal around anchors air tight.
   3. Use flashing to seal to adjacent construction and to bridge joints.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Coordination of ABAA Tests and Inspections:
   1. Provide testing and inspection required by ABAA QAP.
   2. Notify ABAA in writing of schedule for air barrier work, and allow adequate time for testing and inspection.
   3. Cooperate with ABAA testing agency.
   4. Allow access to air barrier work areas and staging.
   5. Do not cover air barrier work until tested, inspected, and accepted.

C. Obtain approval of installation procedures by the weather barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.

D. Take digital photographs of each portion of the installation prior to covering up.

3.05 PROTECTION

A. Do not leave materials exposed to weather longer than recommended by manufacturer.

B. Do not leave paper- or felt-based barriers exposed to weather for longer than one week.

END OF SECTION

SECTION 07 4243 - COMPOSITE WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Rainscreen phenolic resin panel system and accessories.

1.02 RELATED SECTIONS

A. Section 07 2500 – Weather Barriers.

B. Section 07 9005 – Joint Sealers: Sealants.

C. Section 09 2116 – Gypsum Board Assemblies: Metal furring and exterior sheathing.

1.03 SUBMITTALS

A. Submit shop drawings of panel installation, material, panel layout, and accessories to the Architect for review.

B. Submit 8” x 10” panel sample in proposed color to Architect for approval.

C. Submit manufacturer’s data sheets including care and recommended maintenance procedures for incorporation into maintenance manuals.

D. Submit copies of manufacturer’s warranties.

1.04 QUALITY ASSURANCE

A. Installer shall have a minimum of five (5) years of proven experience in the installation of the specified products on projects of a similar size and scope.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle materials in accordance with the site and environmental conditions prescribed by the manufacturer.

B. Remove damaged materials from the site.

1.06 COORDINATION WITH OTHER TRADES

A. All penetrations through the panel for the work of other trades shall be made watertight.

1.07 WARRANTY

A. Provide manufacture’s transferable ten (10) year warranty covering defects in materials. Warranty only available when material installed by certified installation contractor and Shop drawings approved by manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS:

A. Phenolic Resin Composite Panels:
   1. Basis of Design: Trespa Meteon: www.trespa.com.
   2. Substitutions: Section 01 6000 - Product Requirements.

2.02 PHENOLIC RESIN PANELS

A. Phenolic Resin Panels: Cellulose or hemp-fiber paper heat pressed with phenolic resin, color consistant throughout thickness.

B. Color and Style:
   1. <COMP PNL-20>: Color: to be selected from Manufacturer's full range.
   2. <COMP PNL-21>: Color: to be selected from Manufacturer's full range.

C. Surface: Smooth.

D. Fastening: Non-corrosive size and type as recommended by the panel Manufacturer for applicable substrate.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine the work area and notify the Architect of any conditions that would affect the installation or performance of the work.

B. Starting installation constitutes acceptance of substrate conditions.

3.02 PREPARATION

A. Verify site dimensions prior to commencement of work.

B. Take care not to rip or tear sheathing or weather barrier membrane during installation of panel system. Keep sheathing and membrane in repair.

C. Verify that flashings are in place, walls are prepared and covered with either building paper or membrane.

3.03 INSTALLATION

A. Install panels, and system in accordance with manufacturer’s printed instructions and reviewed shop drawings.

B. Secure panels with fasteners and equipment as recommended by the manufacturer.

C. Install panels with joints in line with stud work behind, leave a minimum 5/16” joint between panels.

D. Keep a minimum distance to corners and edges as recommended by the manufacturer.

E. Install panels true to line and level with clean cut edges and joints.

F. In extruded aluminum rainscreen attachment system a minimum 5/16” joint must be maintained for expansion and contraction.

G. Finished installation shall be properly secured, free of rattles, distortions, efflorescence, damaged, or chipped components.

3.04 CLEAN-UP

A. Upon completion of work remove all equipment, tools, surplus materials and garbage.

B. Panel installation shall be left in a clean condition free from construction.

END OF SECTION

SECTION 07 5300 - ELASTOMERIC MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Elastomeric roofing membrane, ballasted conventional application.

B. Insulation, tapered.

C. Vapor retarder.

D. Deck sheathing.

E. Roofing cant strips, stack boots, roofing expansion joints, and walkway pads.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood nailers and curbs.

B. Section 340 - 340: Counterflashings, reglets.

1.03 REFERENCE STANDARDS

A. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2013.

B. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2017.

C. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016.

D. ASTM D448 - Standard Classification for Sizes of Aggregate for Road and Bridge Construction; 2012 (Reapproved 2017).

E. ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers; 2000 (Reapproved 2012).

F. ASTM D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact; 2014.

G. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2015.

H. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.

I. FM (AG) - FM Approval Guide; current edition.

J. FM DS 1-28 - Wind Design; 2016.

K. NRCA (WM) - The NRCA Waterproofing Manual; 2005.

L. SPRI RP-4 - Wind Design Standard for Ballasted Single-Ply Roofing Systems; 2013.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, and fasteners.

C. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, setting plan for tapered insulation, and paver layout.

D. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original containers, dry and undamaged, with seals and labels intact.

B. Store materials in weather protected environment, clear of ground and moisture.

C. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.

D. Protect foam insulation from direct exposure to sunlight.

1.07 FIELD CONDITIONS

A. Do not apply roofing membrane during unsuitable weather.

B. Do not apply roofing membrane when ambient temperature is below 40 degrees F (5 degrees C) or above 100 degrees F (38 degrees C).

C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

E. Schedule applications so that no partially completed sections of roof are left exposed at end of workday.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a two year period after Date of Substantial Completion.

C. General Warranty: The warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

D. Provide manufacturer's standard 20 year, 72 mile per hour, material and labor warranty to cover failure to prevent penetration of water and wind uplift.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. EPDM Membrane Materials:
   1. Carlisle Roofing Systems, Inc: www.carlisle-syntec.com/#sle.
   2. Firestone Building Products, LLC: www.firestonebpco.com.
   3. GenFlex Roofing Systems, LLC: www.genflex.com.
   4. Johns Manville: www.jm.com/#sle.
   5. Mule-Hide Products: www.mulehide.com.
   6. Versico Roofing Systems: www.versico.com/#sle.
   7. Substitutions: See Section 01 6000 - Product Requirements.

B. Insulation:
   1. Dow Chemical Company: www.dow.com.
   2. GAF: www.gaf.com/#sle.
   3. Hunter Panels, LLC: www.hpanels.com.
   4. Owens Corning Corporation: www.owenscorning.com.
   5. Insulation manufactured by the membrane manufacturer is approved.

2.02 ROOFING - BALLASTED APPLICATIONS

A. Elastomeric Membrane Roofing <EPDM-1>: One ply membrane loose-laid over insulation with ballast.

B. Acceptable Insulation Types- Under Membrane - Tapered Application: Any of the types specified.
   1. Uniform thickness polyisocyanurate board covered with tapered polyisocyanurate board.

C. Ballast: Comply with SPRI RP-4 for Category 1, Exposure A, using aggregate over entire surface.

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

A. Membrane: Ethylene-propylene-diene-monomer (EPDM); non-reinforced; complying with minimum properties of ASTM D4637/D4637M.
   1. Thickness: 0.060 inch (60 mil) (1.5 mm).
   2. Color: Black.
   3. Tensile Strength: 1,400 psi (10.0 MPa), measured in accordance with ASTM D412.
   4. Ultimate Elongation: 300 percent, measured in accordance with ASTM D412.
   5. Tear Strength: 150 lbf/inch (26.3 kN/m), measured in accordance with ASTM D624.
   6. Water Vapor Permeability: 0.5 perm inch (0.33 ng/(Pa s m)), measured in accordance with ASTM E96/E96M.
   7. Brittleness Temperature: -49 degrees F (-45 degrees C), measured in accordance with 1.

B. Seaming Materials: As recommended by membrane manufacturer.

C. Vapor Retarder <VPR RET-5>: SBS modified bitumen adhesive with high-density polyethylene top surface, complying with requirements of fire rating classification; compatible with roofing and insulation materials.
   1. Fire-retardant adhesive.
   2. Vapor Permeability: 0.017 perm inch (0.92 ng/(Pa s m)), measured in accordance with ASTM E96/E96M.
   3. Primer: Manufacturer's standard primer as required by substrate.
   4. Product: V-Force manufactured by Firestone or roofing manufacturer's recommended equal product.

D. Flexible Flashing Material: Same material as membrane.
   1. Thickness: 60 mil (1.5 mm).
   2. Color: Black.

2.04 DECK SHEATHING

A. Deck Sheathing: Glass-mat faced gypsum panels complying with ASTM C1177/C1177M.
   1. <RF BRD-1> Thickness: 1/2 inch (12.7 mm), fire-resistant.
   2. Manufacturers:
      a. USG Corporation; Securock Ultralight Glass-Mat Roof Board: www.usg.com/#sle.
      b. DensDeck Prime by Georgia-Pacific.
      c. Substitutions: See Section 01 6000 - Product Requirements.

2.05 INSULATION

A. Insulation System Identification:
   1. <INSUL-51>: Tapered polyisocyanurate insulation over constant thickness polyisocyanurate insulation; minimum two staggered layers of equal thickness; provide tapered insulation over entire roof as indicated in the drawings.

B. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, complying with ASTM C1289.
   1. Classifications:
      a. Type II:
         1) Class 1 - Faced with glass fiber reinforced cellulosic felt facers on both major surfaces of core foam.
         2) Compressive Strength: Classes 1-2-3, Grade 2 - 20 psi (138 kPa), minimum.
         3) Thermal Resistance, R-value (RSI-value): At 1-1/2 inch (38.1 mm) thick; Class 1, Grades 1-2-3 - 8.4 (1.48) at 75 degrees F (24 degrees C).
   2. Board Size: 48 by 96 inch (1220 by 2440 mm).
   3. Board Thickness: 1.5 inch (37.5 mm).
   4. Tapered Board: Slope as indicated; minimum thickness 1/2 inch (12.7 mm); fabricate of fewest layers possible.
   5. Board Edges: Square.

2.06 BALLAST MATERIALS

A. No.2 Aggregate: Sound, hard, washed crushed gravel, ASTM D448 Size Classification 2 or 1.

2.07 ACCESSORIES

A. Cant and Edge Strips: Wood fiberboard, compatible with roofing materials; cants formed to 45 degree angle.

B. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.

C. Membrane Adhesive: As recommended by membrane manufacturer.

D. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.

E. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.

F. Sealants: As recommended by membrane manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is supported and secure.

C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.

D. Verify deck surfaces are dry and free of snow or ice.

E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.02 INSULATION - UNDER MEMBRANE

A. Install vapor retarder to deck surface with adhesive in accordance with manufacturer's instructions.
   1. Extend vapor retarder under cant strips and blocking to deck edge.
   2. Install flexible flashing from vapor retarder to air seal material of wall construction, lap and seal to provide continuity of the air barrier plane.

B. Ensure vapor retarder is clean and dry, continuous, and ready for application of insulation.

C. Attachment of Insulation:
   1. Mechanically fasten first layer of insulation to deck in accordance with roofing manufacturer's instructions and FM (AG) Factory Mutual requirements.

D. Lay subsequent layers of insulation with joints staggered minimum 6 inch (150 mm) from joints of preceding layer.

E. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.

F. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

G. At roof drains, use factory-tapered boards to slope down to roof drains over a distance of 18 inches (450 mm).

H. Do not apply more insulation than can be covered with membrane in same day.

3.03 INSTALLATION - MEMBRANE

A. Install elastomeric membrane roofing system in accordance with manufacturer's recommendations and NRCA (WM) applicable requirements.

B. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

C. Shingle joints on sloped substrate in direction of drainage.

D. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches (75 mm). Seal permanently waterproof. Apply uniform bead of sealant to joint edge.

E. At intersections with vertical surfaces:
   1. Extend membrane over cant strips and up a minimum of 4 inches (100 mm) onto vertical surfaces.
   2. Fully adhere flexible flashing over membrane and up to nailing strips.

F. At gravel stops, extend membrane under gravel stop and to the outside face of the wall.

G. Around roof penetrations, seal flanges and flashings with flexible flashing.

H. Coordinate installation of roof drains and sumps and related flashings.

3.04 INSTALLATION - BALLAST

A. Ballast: Evenly distribute aggregate ballast, and install in accordance with SPRI RP-4.

3.05 CLEANING

A. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.

B. Remove bituminous markings from finished surfaces.

C. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.

D. Repair or replace defaced or damaged finishes caused by work of this section.

3.06 PROTECTION

A. Protect installed roofing and flashings from construction operations.

B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

SECTION 07 6200 - SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sealants for joints within sheet metal fabrications.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood nailers for sheet metal work.

B. Section 07 9200 - Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.

1.03 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2017a.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

D. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007, with Editorial Revision (2012).

E. CDA A4050 - Copper in Architecture - Handbook; current edition.

F. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

A. Pre-Finished Galvanized Steel <SMF-1>: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gauge, (0.0239) inch (0.61 mm) thick base metal, shop pre-coated with PVDF coating.
   1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
   2. Color: As selected by Architect from manufacturer's standard colors.

2.02 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Form pieces in longest possible lengths.

C. Hem exposed edges on underside 1/2 inch (13 mm); miter and seam corners.

D. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

E. Fabricate corners from one piece with minimum 18 inch (450 mm) long legs; seam for rigidity, seal with sealant.

F. Fabricate flashings to allow toe to extend 2 inches (50 mm) over roofing gravel. Return and brake edges.

2.03 ACCESSORIES

A. Fasteners: Galvanized steel, with soft neoprene washers.

B. Primer: Zinc chromate type.

C. Concealed Sealants: Non-curing butyl sealant.

D. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.

E. Plastic Cement: ASTM D4586/D4586M, Type I.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Install surface mounted reglets true to lines and levels, and seal top of reglets with sealant.

C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil (0.4 mm).

3.03 INSTALLATION

A. Insert flashings into reglets to form tight fit; secure in place with lead wedges; seal flashings into reglets with sealant.

B. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted..

C. Apply plastic cement compound between metal flashings and felt flashings.

D. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

E. Seal metal joints watertight.

END OF SECTION

SECTION 07 8400 - FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Firestopping systems.

B. Firestopping of joints and penetrations in fire resistance rated and smoke resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.02 REFERENCE STANDARDS

A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2016a.

B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2013a (Reapproved 2017).

C. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems; 2015.

D. ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus; 2015b, with Editorial Revision (2016).

E. ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies; 2013 (Reapproved 2017).

F. ITS (DIR) - Directory of Listed Products; current edition.

G. FM (AG) - FM Approval Guide; current edition.

H. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.

I. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.

J. UL (DIR) - Online Certifications Directory; Current Edition.

K. UL (FRD) - Fire Resistance Directory; Current Edition.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on product characteristics, performance ratings, and limitations.

C. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Certificate from authority having jurisdiction indicating approval of materials used.

F. Installer Qualification: Submit qualification statements for installing mechanics.

1.04 QUALITY ASSURANCE

A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
   1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.
   2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.
   3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section and:
   1. Verification of minimum three years documented experience installing work of this type.

D. Firestop sealants upon curing, shall not re-emulsify, dissolve, leach, breakdown or otherwise be damaged over time from exposure to atmospheric moisture, sweating pipes, ponding water or other forms of moisture characteristic in a building's normal operating life.

E. Firestop sealants selected shall be sufficiently flexible to accommodate motion such as pipe vibration, water-hammer, thermal expansion, and other normal building movement, without damage to the seal.

F. One manufacturer shall supply all firestopping material to the extent possible.

G. All firestop materials shall be installed prior to expiration of shelf life.

1.05 COORDINATION

A. Schedule firestopping after installation of penetrants, but prior to concealing the openings.

B. Firestopping shall precede gypsum board finishing.

1.06 FIELD CONDITIONS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.

B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Firestopping Manufacturers:
   1. 3M Fire Protection Products: www.3m.com/firestop.
   2. A/D Fire Protection Systems Inc: www.adfire.com.
   3. Hilti, Inc: www.us.hilti.com/#sle.
   4. Nelson FireStop Products: www.nelsonfirestop.com.
   5. Specified Technologies Inc: www.stifirestop.com/#sle.
   6. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.

7. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Firestopping Materials: Any materials meeting requirements.

B. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.

C. Fire Ratings: Refer to drawings for required systems and ratings.

2.03 FIRESTOPPING ASSEMBLY REQUIREMENTS

A. Perimeter Fire Containment Firestopping: Use system that has been tested according to ASTM E2307 to have fire resistance F Rating equal to required fire rating of floor assembly.
   1. Movement: Provide systems that have been tested to show movement capability as indicated.
   2. Temperature Rise: Provide systems that have been tested to show T Rating as indicated.
   3. Air Leakage: Provide systems that have been tested to show L Rating as indicated.
   4. Where floor assembly is not required to have a fire rating, provide systems that have been tested to show L Rating as indicated.

B. Head-of-Wall Joint System Firestopping at Joints Between Fire-Rated Wall Assemblies and Non-Rated Horizontal Assemblies: Use system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of floor or wall, whichever is greater.
   1. Movement: Provide systems that have been tested to show movement capability as indicated.

C. Floor-to-Floor, Wall-to-Wall, and Wall-to-Floor Joints, Except Perimeter, Where Both Are Fire-Rated: Use system that has been tested according to ASTM E1966 or UL 2079 to have fire resistance F Rating equal to required fire rating of the assembly in which the joint occurs.
   1. Movement: Provide systems that have been tested to show movement capability as indicated.
   2. Air Leakage: Provide systems that have been tested to show L Rating as indicated.
   3. Watertightness: Provide systems that have been tested to show W Rating as indicated.
   4. Listing by FM (AG), ITS (DIR), UL (DIR), or UL (FRD) in their certification directories will be considered evidence of successful testing.

D. Through Penetration Firestopping: Use system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.
   1. Temperature Rise: Provide systems that have been tested to show T Rating as indicated.
   2. Air Leakage: Provide systems that have been tested to show L Rating as indicated.
   3. Watertightness: Provide systems that have been tested to show W Rating as indicated.
   4. Listing by FM (AG), ITS (DIR), UL (DIR), or UL (FRD) in their certification directories will be considered evidence of successful testing.

2.04 FIRESTOPPING SYSTEMS

A. Firestopping <FR STOP>: Any material meeting requirements.
   1. Fire Ratings: Use system that is listed by FM (AG), ITS (DIR), or UL (FRD) and tested in accordance with ASTM E814, ASTM E119, or UL 1479 with F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and in compliance with other specified requirements.

PART 3 EXECUTION

3.01 CONDITIONS REQUIRING FIRESTOPPING

A. General: Provide firestopping for conditions specified whether or not firestopping is indicated, and if indicated, whether such materials designated as insulation, safing, or otherwise.

B. Through-Penetration: Firestopping shall be installed in all open penetrations and in the annular space in all penetrations in any bearing or non-bearing fire-rated barrier.

C. Membrane-Penetration: Where required by code, all membrane-penetrations in rated walls shall be protected with firestopping products that meet the requirements of third party time/temperature testing.

D. Construction Joints/Gaps: Firestopping shall be provided at all fire rated walls as indicated on project drawings.
   1. Between the tops of walls and the underside of floors.
   2. In expansion joints at fire rated walls.
   3. In any penetration through fire rated wall, fill gaps and spaces with fire stopping material sufficeint to maintain intended wall rating.
   4. Smoke-Stopping: As required by the other sections, smoke-stops shall be provided for through-penetrations, membrane-penetrations, and construction gaps with a material approved and tested for such application.

3.02 EXAMINATION

A. Verify openings are ready to receive the work of this section.

3.03 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.

B. Remove incompatible materials that could adversely affect bond.

C. Install backing materials to prevent liquid material from leakage.

3.04 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

B. Do not cover installed firestopping until inspected by authorities having jurisdiction.

C. Install labeling required by code.

3.05 MARKING AND IDENTIFICATION

A. Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling. Such identification shall:
   1. Be located in accessible concealed floor, floor-ceiling or attic spaces;

2. Be located within 15 feet (4572 mm) of the end of each wall and at intervals not exceeding 30 feet (9144 mm) measured horizontally along the wall or partition; and
3. Include lettering not less than 3 inches (76 mm) in height with a minimum 3/8 inch (9.5 mm) stroke in a contrasting color incorporating the suggested wording. "FIRE AND/OR SMOKE BARRIER-PROTECT ALL OPENINGS" or other wording.

3.06 CLEANING

A. Clean adjacent surfaces of firestopping materials.

3.07 PROTECTION

A. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 07 9200 - JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Self-leveling pourable joint sealants.

C. Joint backings and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 1300 - Sheet Waterproofing: Sealing cracks and joints in waterproofing substrate surfaces using materials specified in this section.

B. Section 07 2500 - Weather Barriers: Sealants required in conjunction with air barriers and vapor retarders.

C. Section 07 8400 - Firestopping: Firestopping sealants.

D. Section 09 2116 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.

E. Section 09 3000 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.

1.03 REFERENCE STANDARDS

A. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants; 2015a.

B. ASTM C834 - Standard Specification for Latex Sealants; 2017.

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

D. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2016.

E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

F. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2008 (Reapproved 2012).

G. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2002 (Reapproved 2013).

H. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015e1.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.

1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
2. List of backing materials approved for use with the specific product.
3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
4. Substrates the product should not be used on.

C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

D. Samples for Verification: Where custom sealant color is specified, obtain directions from Architect and submit at least two physical samples for verification of color of each required sealant.

E. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of experience.

B. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
1. Adhesion Testing: In accordance with ASTM C794.
2. Compatibility Testing: In accordance with ASTM C1087.
3. Allow sufficient time for testing to avoid delaying the work.
4. Deliver to manufacturer sufficient samples for testing.
5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
6. Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal , exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Non-Sag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.
1. Bostik Inc: www.bostik-us.com.
2. Dow Chemical Company: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.
3. Hilti, Inc: www.us.hilti.com.
4. Momentive Performance Materials, Inc (formerly GE Silicones): www.momentive.com.
5. Pecora Corporation: www.pecora.com.
6. Sherwin-Williams Company: www.sherwin-williams.com.
7. Sika Corporation: www.usa-sika.com.
8. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
9. W.R. Meadows, Inc: www.wrmeadows.com.

10. Substitutions: See Section 01 6000 - Product Requirements.

B. Self-Leveling Sealants: Pourable or self-leveling sealant that has sufficient flow to form a smooth, level surface when applied in a horizontal joint.
   1. Bostik Inc: www.bostik-us.com.
   2. Dow Chemical Company: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.
   3. Pecora Corporation: www.pecora.com.
   4. Sherwin-Williams Company: www.sherwin-williams.com.
   5. Sika Corporation: www.usa-sika.com.
   6. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
   7. W.R. Meadows, Inc: www.wrmeadows.com.
   8. Substitutions: See Section 01 6000 - Product Requirements.

2.02 JOINT SEALANT APPLICATIONS

A. Scope:
   1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
      a. Wall expansion and control joints.
      b. Joints between door, window, and other frames and adjacent construction.
      c. Joints between different exposed materials.
      d. Openings below ledge angles in masonry.
      e. Other joints indicated below.
   2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
      a. Joints between door, window, and other frames and adjacent construction.
      b. Other joints indicated below.
   3. Do not seal the following types of joints.
      a. Intentional weepholes in masonry.
      b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
      c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
      d. Joints where installation of sealant is specified in another section.
      e. Joints between suspended panel ceilings/grid and walls.

B. Exterior Joints: Use non-sag non-staining silicone sealant, unless otherwise indicated.
   1. Lap Joints in Sheet Metal Fabrications: Butyl rubber, non-curing.

C. Interior Joints: Use non-sag polyurethane sealant, unless otherwise indicated.
   1. Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant.
   2. Wall and Ceiling Joints in Wet Areas: Non-sag polyurethane sealant for continuous liquid immersion.
   3. Floor Joints in Wet Areas: Non-sag polyurethane "non-traffic-grade" sealant suitable for continuous liquid immersion.
   4. Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; white.
   5. In Sound-Rated Assemblies: Acrylic emulsion latex sealant.
   6. Narrow Control Joints in Interior Concrete Slabs: Self-leveling epoxy sealant.
   7. Other Floor Joints: Self-leveling polyurethane "traffic-grade" sealant.

D. Interior Wet Areas: Bathrooms, restrooms, kitchens, food service areas, and food processing areas; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets, and other similar items.

E. Sound-Rated Assemblies: Walls and ceilings identified as "STC-rated", "sound-rated", or "acoustical".

2.03 JOINT SEALANTS - GENERAL

A. Material ID's:
   1. <SEALANT-1>: Joint sealant or caulking with or without backer rod. Type as indicated above.

2.04 NONSAG JOINT SEALANTS

A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 50 percent, minimum.
   2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
   3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
   4. Color: To be selected by Architect from manufacturer's standard range.
   5. Cure Type: Multi-component, neutral curing.
   6. Service Temperature Range: Minus 20 to 180 degrees F (Minus 29 to 82 degrees C).

B. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
   1. Color: White.

C. Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
   1. Color: To be selected by Architect from manufacturer's standard range.
   2. Grade: ASTM C834; Grade Minus 18 Degrees C (0 Degrees F).

2.05 SELF-LEVELING SEALANTS

A. Self-Leveling Polyurethane Sealant for Continuous Water Immersion: Polyurethane; 1, Grade P, Uses M and A; single or multi-component; explicitly approved by manufacturer for traffic exposure and continuous water immersion.
   1. Color: To be selected by Architect from manufacturer's standard range.
   2. Service Temperature Range: Minus 40 to 180 degrees F (Minus 40 to 82 degrees C).

B. Semi-Rigid Self-Leveling Epoxy Joint Filler: Epoxy or epoxy/polyurethane copolymer; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.
   1. Composition: Multi-component, 100 percent solids by weight.
   2. Durometer Hardness: Minimum of 85 for Type A or 35 for Type D, after seven days when tested in accordance with ASTM D2240.
   3. Color: To be selected by Architect from manufacturer's standard colors.
   4. Joint Width, Minimum: 1/8 inch (3 mm).
   5. Joint Width, Maximum: 1/4 inch (6 mm).
   6. Joint Depth: Provide product suitable for joints from 1/8 inch (3 mm) to 2 inches (51 mm) in depth including space for backer rod.

2.06 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
   1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type O - Open Cell Polyurethane.
   2. Type for Joints Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type B - Bi-Cellular Polyethylene.
   3. Open Cell: 40 to 50 percent larger in diameter than joint width.
   4. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

D. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

E. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

D. Install bond breaker backing tape where backer rod cannot be used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

F. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

G. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

H. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

END OF SECTION

SECTION 08 1113 - HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Hollow metal frames for wood doors.

C. Fire-rated hollow metal frames.

D. Thermally insulated hollow metal doors with frames.

E. Hollow metal borrowed lites glazing frames.

1.02 RELATED REQUIREMENTS

A. Section 08 7100 - Door Hardware.

B. Section 08 8000 - Glazing: Glass for doors and borrowed lites.

C. Section 09 9113 - Exterior Painting: Field painting.

D. Section 09 9123 - Interior Painting: Field painting.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2011.

C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.

D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.

F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2016.

G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2017.

H. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2015a.

I. ASTM C476 - Standard Specification for Grout for Masonry; 2018.

J. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2016.

K. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

L. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.

M. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.

N. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; 2007.

O. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2014.

P. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2013.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.

B. Maintain at project site copies of reference standards relating to installation of products specified.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:
   1. Ceco Door or Curries, an Assa Abloy Group company: www.assaabloydss.com.
   2. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.
   3. Steelcraft, an Allegion brand: www.allegion.com/us.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:
   1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
   2. Accessibility: Comply with ICC A117.1 and ADA Standards.
   3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
   4. Door Edge Profile: Manufacturers standard for application indicated.
   5. Typical Door Face Sheets: Flush.
   6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturers standard.
   7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
      a. Provide minimum 3/16" plate steel as reinforcement for hardware. If the manufacturer's standard is for a greater thickness at specific locations, provide the thicker of the two standards.
   8. Electrified Hardware Preparation:
      a. Provide electrical conduit and junction-boxes as required for electric power and signal routing and for electrical terminations as required to support electrical and electronic hardware indicated in Section 08 7100.
      b. Secure conduit and boxes to the frame and doors. Extend conduit attached to frames 12 inches above frame for connection to conduit furnished by other sections.
      c. Coordinate locations of conduit and boxes with Section 08 7100.
   9. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
      a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Exterior Doors: Thermally insulated.
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 3 - Extra Heavy-duty.
      b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 2 - Seamless.
      d. Door Face Metal Thickness: 20 gauge, 0.032 inch (0.8 mm), minimum.
      e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
   2. Door Thickness: 1-3/4 inches (44.5 mm), nominal.
   3. Door Finish: Factory primed and field finished.

B. Interior Doors, Non-Fire Rated:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 3 - Extra Heavy-duty.
      b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 2 - Seamless.
      d. Door Face Metal Thickness: 16 gauge, 0.053 inch (1.3 mm), minimum.
   2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
   3. Door Thickness: 1-3/4 inches (44.5 mm), nominal.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Frame Finish: Factory primed and field finished.

C. Exterior Door Frames: Full profile/continuously welded type.
   1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A60/ZF180 coating.
   2. Frame Metal Thickness: 14 gauge, 0.067 inch (1.7 mm), minimum.
   3. Weatherstripping: Separate, see Section 08 7100.

D. Interior Door Frames, Non-Fire Rated: Face welded type.
   1. Frame Metal Thickness: 16 gauge, 0.053 inch (1.3 mm), minimum; except 14 gage, 0.067 inch (1.7 mm) for masonry applications.

E. Door Frames, Fire-Rated: Face welded type.
   1. Fire Rating: Same as door, labeled.
   2. Frame Metal Thickness: 16 gauge, 0.053 inch (1.3 mm), minimum; except 14 gage, 0.067 inch (1.7 mm) for masonry applications.

F. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.

G. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.

H. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.

I. Frames Wider than 48 inches (1219 mm): Reinforce with steel channel fitted tightly into frame head, flush with top.

2.05 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

2.06 ACCESSORIES

A. Glazing: As specified in Section 08 8000.

B. Grout for Frames: Mortar grout complying with ASTM C476 with maximum slump of 4 inches (102 mm) as measured in accordance with ASTM C143/C143M for hand troweling in place; plaster grout and thinner pumpable grout are prohibited.

C. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

D. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Coordinate frame anchor placement with wall construction.

C. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.

D. Install door hardware as specified in Section 08 7100.

E. Comply with glazing installation requirements of Section 08 8000.

F. Coordinate installation of electrical connections to electrical hardware items.

3.04 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.

B. Maximum Diagonal Distortion: 1/16 inch (1.6 mm) measured with straight edge, corner to corner.

3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

END OF SECTION

SECTION 08 1416 - FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flush wood doors; flush and flush glazed configuration; fire-rated and non-rated.

1.02 RELATED REQUIREMENTS

A. Section 08 1113 - Hollow Metal Doors and Frames.

B. Section 08 7100 - Door Hardware.

C. Section 08 8000 - Glazing.

1.03 REFERENCE STANDARDS

A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014, with Errata (2016).

B. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.

D. Samples: Submit two samples of door veneer, 6 x 6 inch (152 x 152 mm) in size illustrating wood grain, stain color, and sheen.

E. Manufacturer's Installation Instructions: Indicate special installation instructions.

F. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging, and inspect for damage.

C. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Interior Doors: Provide manufacturer's warranty for the life of the installation.

C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wood Veneer Faced Doors:
   1. Masonite Architectural: www.architectural.masonite.com/#sle.
   2. Oregon Door; Architectural Series: www.oregondoor.com/#sle.
   3. VT Industries, Inc: www.vtindustries.com/#sle.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DOORS

A. Doors: See drawings for locations and additional requirements.
   1. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS), unless noted otherwise.
   2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.

B. Interior Doors: 1-3/4 inches (44 mm) thick unless otherwise indicated; flush construction.
   1. Provide solid core doors at each location.
   2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with UL 10C - Positive Pressure; Underwriters Laboratories Inc (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.
   3. Wood veneer facing with factory transparent finish as indicated on drawings.

2.03 DOOR AND PANEL CORES

A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.

B. Fire-Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

2.04 DOOR FACINGS

WHITE MAPLE

A. Veneer Facing for Transparent Finish: ~~Maple~~, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.
   1. Vertical Edges: Same species as face veneer.
   2. "Pair Match" each pair of doors; "Set Match" pairs of doors within 10 feet (3 m) of each other when doors are closed.

2.05 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Provide sustainably harvested wood, certified or labeled as specified in Section 01 6000.

C. Provide composite wood containing no added formaldehyde. See Section 01 6116.

D. Cores Constructed with stiles and rails:
   1. Provide solid blocks at lock edge and top of door for closer for hardware reinforcement.
   2. Provide solid blocking for other throughbolted hardware.

E. Where supplementary protective edge trim is required, install trim after veneer facing has been applied full-width.

F. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

G. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

H. Provide edge clearances in accordance with the quality standard specified.

2.06 FINISHES - WOOD VENEER DOORS

A. Finish work in accordance with AWI/AWMAC/WI (AWS), Section 5 - Finishing for grade specified and as follows:
   1. Transparent:
      a. System - 9, UV Curable, Acrylated Epoxy, Polyester or Urethane.
      b. Stain: As selected by Architect.
      c. Stain: Custom to match Wilsonart Kingswood Walnut.
      d. Sheen: Satin.

B. Seal door top edge with color sealer to match door facing.

2.07 ACCESSORIES

A. Glazing: See Section 08 8000.

B. Glazing Stops: Rolled steel channel shape, mitered corners; prepared for countersink style tamper proof screws.

C. Door Hardware: See Section 08 7100.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.

B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.

C. Use machine tools to cut or drill for hardware.

D. Coordinate installation of doors with installation of frames and hardware.

E. Coordinate installation of glazing.

3.03 TOLERANCES

A. Comply with specified quality standard for fit and clearance tolerances.

B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

END OF SECTION

SECTION 08 3100 - ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall and ceiling mounted access units.

1.02 RELATED REQUIREMENTS

A. Section 09 9123 - Interior Painting: Field paint finish.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

C. Shop Drawings: Indicate exact position of each access door and/or panel unit.

D. Manufacturer's Installation Instructions: Indicate installation requirements.

PART 2 PRODUCTS

2.01 WALL AND CEILING MOUNTED ACCESS UNITS

A. Manufacturers:
   1. ACUDOR Products Inc: www.acudor.com/#sle.
   2. Babcock-Davis: www.babcockdavis.com/#sle.
   3. Cendrex, Inc: www.cendrex.com/#sle.
   4. Karp Associates, Inc: www.karpinc.com.
   5. Milcor, Inc: www.milcorinc.com.
   6. Nystrom, Inc: www.nystrom.com/#sle.
   7. Substitutions: See Section 01 6000 - Product Requirements.

B. Door and Frameless Units <ACC PNL-1>: Factory fabricated, fully assembled units with corner joints welded, filled, and ground flush; square and without rack or warp; coordinate requirements with assemblies units are to be installed in.
   1. Material: Steel.
   2. Style: Exposed frame with door surface flush with frame surface.
      a. Gypsum Board Mounting Criteria: Use drywall bead type frame.
   3. Door Style: Single thickness with rolled or turned in edges.
   4. Frames: 16 gauge, 0.0598 inch (1.52 mm), minimum thickness.
   5. Single Steel Sheet Door Panels: 1/16 inch (1.6 mm), minimum thickness.
   6. Steel Finish: Primed.
   7. Size: As scheduled above unless otherwise indicated in the drawings.
   8. Hardware:
      a. Hinges for Non-Fire-Rated Units: Continuous piano hinge.
      b. Latch/Lock: Screw driver slot for quarter turn cam latch.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

3.02 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install frames plumb and level in openings, and secure units rigidly in place.

C. Position units to provide convenient access to concealed equipment when necessary.

END OF SECTION

SECTION 08 3326 - OVERHEAD COILING GRILLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Overhead coiling metal grilles and operating hardware; electrically operated.

B. Wiring from electric circuit disconnect to operator and to control station.

1.02 RELATED REQUIREMENTS

A. Division 26: Power to disconnect and conduit.

1.03 REFERENCE STANDARDS

A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

B. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2013.

C. ITS (DIR) - Directory of Listed Products; current edition.

D. UL (DIR) - Online Certifications Directory; Current Edition.

E. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide general construction component connections and details, and electrical equipment.

C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.

D. Manufacturer's Installation Instructions: Indicate installation sequences and procedures, adjustment and alignment procedures.

1.05 QUALITY ASSURANCE

A. Provide certificate of compliance from authorities having jurisdiction indicating approval of grille and operating hardware assembly.

B. Products Requiring Electrical Connection: Listed and classified by ITS (DIR), UL (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for purpose specified.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Overhead Coiling Grilles:
   1. Overhead Door Corporation: www.overheaddoor.com.
   2. Alpine Overhead Doors, Inc: www.alpinedoors.com/#sle.
   3. Cornell Iron Works, Inc: www.cornelliron.com/#sle.
   4. The Cookson Company: www.cooksondoor.com/#sle.
   5. Wayne-Dalton, a Division of Overhead Door Corporation: www.wayne-dalton.com/#sle.
   6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 GRILLES AND COMPONENTS

A. Basis of Design: Overhead Door Corp Upward-Coiling Security Grille Model 670.
   1. Grille: Aluminum mill finish; horizontal bar curtain, coiling on overhead counterbalanced shaft.
   2. Electric operation with key switch.
   3. Mounting: Interior face of wall.
   4. Pattern: Straight lattice.
   5. Guides: Extruded aluminum angles, of profile to retain grille in place with snap-on trim, mounting brackets of same metal.
   6. Lock Hardware:
      a. For motor operated units, additional lock or latching mechanisms are not required.

2.03 MATERIALS

A. Aluminum: ASTM B221 (ASTM B221M).

2.04 ELECTRIC OPERATION

A. Operator, Controls, Actuators, and Safeties: Comply with UL 325; provide products listed by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.
   1. Provide interlock switches on motor operated units.

B. Control Station: Provide standard three button (Open-Close-Stop) momentary-contact control device for each operator complying with UL 325.
   1. 24 volt circuit.
   2. Surface mounted, at interior door jamb.
   3. Entrapment Protection Devices: Provide sensing devices and safety mechanisms complying with UL 325.
      a. Primary Device: Provide electric sensing edge, wireless sensing, NEMA 1 photo eye sensors, or NEMA 4X photo eye sensors as required with momentary-contact control device.

C. Safety Edge: Located at bottom of coiling grill, full width, electro-mechanical sensitized type, wired to stop and reverse grill direction upon striking object, hollow neoprene covered.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that opening sizes, tolerances and conditions are acceptable.

3.02 INSTALLATION

A. Install grille unit assembly in accordance with manufacturer's instructions.

B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

C. Securely and rigidly brace components suspended from structure.

D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

E. Complete wiring from disconnect to unit components.

3.03 TOLERANCES

A. Maintain dimensional tolerances and alignment with adjacent work.

B. Maximum Variation From Plumb: 1/16 inch (1.5 mm).

C. Maximum Variation From Level: 1/16 inch (1.5 mm).

D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft (3 mm per 3 m) straight edge.

3.04 ADJUSTING

A. Adjust grille, hardware and operating assemblies for smooth and noiseless operation.

3.05 CLEANING

A. Clean grille and components.

B. Remove labels and visible markings.

END OF SECTION

SECTION 08 4113 - ALUMINUM FRAMED SLIDING GLASS WALLS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. All-glass walls

1.02 REFERENCES

A. American Architectural Manufacturers Association (AAMA):
   1. AAMA 611, Voluntary Specification for Anodized Architectural Aluminum.
   2. AAMA 2604, Voluntary Specifications, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
   3. AAMA 1303.5, Voluntary Specifications for Forced Entry Resistant Aluminum Sliding Glass Doors.
   4. AAMA 920, Operation / Cycling Performance

B. American National Standards Institute (ANSI):
   1. ANSI Z97.1, Safety Performance Specifications and Methods of Test for Safety Glazing Material Used In Build- ings.

C. American Society for Testing and Materials (ASTM):
   1. ASTM E 283, Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
   2. ASTM E 330, Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
   3. ASTM E 547, Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential.

D. Consumer Product Safety Commission (CPSC):
   1. CPSC 16CFR-1201, Safety Standard for Architectural Glazing Materials.

E. National Fenestration Rating Council (NFRC):
   1. NFRC 100, Procedure for Determining Fenestration Product Thermal Materials.
   2. NFRC 200, Procedure for Determining Solar Heat Gain Coefficient.

1.03 SUBMITTALS

A. Product Drawings: Indicate dimensioning, configuration, swing panels, stacking bay layout, typical head jamb, side jambs and sill details, type of glazing material and handle height.

B. Product Data: Manufacturer's literature including independently tested data listing performance criteria and Owner's Manual with installation instructions.

C. Contract Closeout Submittal: Submit Owner's Manual from manufacturer. Identify with project name, location and completion date, and type and size of unit installed.

1.04 QUALITY ASSURANCE

A. Manufacturer: Provide complete, precision built, engineered, pre-fitted unit by a single source manufacturer with at least 25 years experience in the sale of folding/sliding door systems for large openings in the North American market.

1. The manufacturer must have a quality management system registration to the ISO 9001: 2008 standard.
2. The manufacturer must have an environmental management system registration to the ISO 14001: 2005 standard.

B. Performance Requirements: Provide from manufacturer that has independently tested typical units with the following minimum results:
1. Structural Test Performance: Provide system that when tested according to ASTM E330 at 150% of positive and negative design pressures with panel sizes of 3'1" wide and 9'5" high achieved a DP rating of +/- 45 psf (+/- 2,160 Pa).
2. Forced Entry Resistance: Provide system that when tested according to ASTM F842 Grade 40, there was no entry.
3. Operation / Cycling Performance of incorporated Swing Panel: Provide system that when tested accord- ing to AAMA 920, there was no failure after 500,000 cycles (requirement for AW Performance Class).
4. Solar Heat Gain Coefficient: Unit to be rated, certified and labeled in accordance with NFRC 200, with values shown in manufacturer's latest published data for the glazing and sill specified.
5. Installer Qualifications: Installer experienced in the installation of manufacturer's products or other similar products for large openings. Installer to provide reference list of at least 3 projects of similar scale and complexity success- fully completed in the last 3 years.

1.05 WARRANTY

A. Provide manufacturer's standard warranty against defects in materials and workmanship.

B. Warranty Period: Ten years for roller and for seal failure of insulated glass supplied. For all other components, one year (two years if unit is installed by manufacturers certified trained installer) from date of delivery by manufacturer.

1.06 SITE CONDITIONS, DELIVERY, STORAGE AND HANDLING

A. In addition to general delivery, storage and handling requirements specified in Section 01 6000, comply with the following:
1. Deliver materials to job site in sealed, unopened cartons or crates. Protect units from damage. Store material under cover, protected from weather and construction activities.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: NanaWall Systems; NW Acoustical 645: www.nanawall.com.

B. Substitutions: Section 01 6000 - Quality Requirements.
1. Request for substitution of the specified product must submit substitution request two weeks before bid for prior approval.

2.02 MATERIALS

A. Frames and Panels: From manufacturer's standard profiles, provide head tracks, stacking bays, side jambs, sliding panels, and sliding panels with incorporated swing panels with dimensions shown on drawings.
1. Head track: Recessed clear anodized aluminum.
2. Panels: Standard with one lite as indicated in drawings.

3. Bottom Rail: Manufacturer's standard; minimal surface mounted solution.
4. Aluminum Extrusion: Extrusions with nominal thickness of .078” (2.0 mm). Alloy specified as AIMgSi0.5 with strength rated as 6063-T5 or F-22 (European standard). Anodized conforming to AAMA 611, powder coated conforming to AAMA 2604.
5. Panels thermally broken with 7/8” (22 mm) Polyamide plastic reinforced with glass fibers. Standard aluminum head jamb. Polyamide plastic less than 7/8" (22 mm) wide or pour and de-bridge thermal break will not be accepted. (Thermal breaks required for acoustic properties.)
6. Aluminum Finish:
    a. Matte powder coat finish as selected from manufacturer's full range of 150 standard colors.
    b. Provide the same finishes on inside and outside.

B. Glass:
1. All glass to comply with safety glazing requirements of ANSI Z97.1 and CPSC 16CFR 1201. Provide manufacturer’s standard glass with dry glazing with glass stops on the inside only:
    a. Manufacturer's special insulated laminated safety glass meeting a minimum STC of 45.

C. Locking Hardware and Handles:
1. Main entry panel:
    a. On the main entry swinging panels, provide harware listed below. All hardware shall be provided and installed by the wall manufacturer. Refer to Section 08 7100 - Door Hardware for acceptable manufacturers and products.
        1) Hinges as required - Manufacturer's standard.
        2) Panic exit device with classroom function. Device model must be "stackable" when wall is open.
        3) Door closer with hold open function.
        4) Acoustic door seals.
2. For any incorporated swing panel, provide crank handle stored in flap on panel stile to convert sliding panel to a swing panel and vice versa. Conversion Box located on upper arm of top rail to be polyamide in silver gray finish. If swing door to frame fixing hardware for operation of the incorporated door is above 7'0" provide with an integrated pole for single person operation. Operation above 7'0" should be easy to complete and not require additional mean to reach the fixing/locking mechanism other than the provided pole.
3. To ensure ease of operation and rigid security, only geared positive attachment to affix the swing door to the frame for incorporated swing doors will be accepted.
4. For pinch resistance, only rounded extrusions on the pivot side of incorporated swing panels are allowed.

D. Sliding & Swinging Hardware: Provide manufacturer’s standard hardware.
1. For each sliding panel, provide 2 two-three wheeled, sintered bronze (oil impregnated) unidirectional sliding panel carriers with a one wheeled, Polymide guide roller that are attached to the panels with stainless steel rods. Maximum carrying capacity of two carriers on a panel to be 330 lbs (150 kgs).
2. Provide on all four corners of sliding panels and incorporated swing panels, thermally broken, die cast zinc multi- functional corner fittings with carrier connectors, male and female locking receptacles, hinges and hinge pins as required. Finish: Powder coated, closest match to finish of frame and panels.
3. Provide on the pivot side corner of the upper arm of the top rail of the incorporated swing panel a circular cover in polyamide with a silver gray finish.
4. Adjustment: Provide system capable of specified amount of adjustments without removing panels from tracks.

2.03 FABRICATION

A. Use extruded aluminum frame and panel profiles, corner connectors and hinges, sliding hardware, locking hardware and handles, glass and glazing and weather stripping as specified herein to make a sliding glass wall. Factory pre-assemble as is standard for manufacturer and ship with all components and installation instructions.

B. Sizes and Configurations: See drawings for selected number and size of panels, location of swing panels, and location of tracks and stacking bays.

2.04 ACCESSORIES

A. Provide other side lites, transoms, corner posts, or single or double doors, fasteners, and other accessories as required for a full and complete installation.

B. Floor inserts for securing panels in place. Do not provide a continuous floor track.

PART 3 - EXECUTION

3.01 ERECTION

A. Because of the large dimensions involved and the weight and movement of the panels, verify the structural integrity of the header such that the maximum deflection with live and loads is limited to be the lesser of l/720 of the span and 1/4" (6 mm). Similar structural support is needed for the stacking bay(s) and any upper track leading to it.

B. It is recommended that all building dead loads be applied to the header prior to installing folding wall system. If so and if a reasonable amount of time has been allowed for the effect of this dead load on the header, then only the building's live load can be used to meet the above requirements of L/720 or 1/4" (6 mm). If not, both the dead and live loads need to be considered.

C. Examine surfaces of openings and verify dimensions; verify rough openings are level, plumb, and square, with no unevenness, bowing, or bumps on floor.

D. Installation of units constitutes acceptance of existing conditions.

3.02 INSTALLATION

A. Install frame in accordance with manufacturer's recommendations and installation Instructions. Properly flash and waterproof around the perimeter of the opening.

B. Installer to provide anchorage devices and to securely and rigidly fit frame in place, absolutely level, straight, plumb and square. Install frame in proper elevation, plane and location, and in proper alignment with other work.

C. Install panels, handles and lock set in accordance with manufacturer's recommendations and installation instructions.

D. Adjust hardware for proper operation.

END OF SECTION

SECTION 08 4229 - AUTOMATIC ENTRANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Operators for doors provided in other sections.

B. Controllers, actuators and safety devices.

1.02 RELATED REQUIREMENTS

A. Section 08 7100 - Door Hardware: Low-energy operator submittal requirements.

1.03 REFERENCE STANDARDS

A. BHMA A156.10 - American National Standard for Power Operated Pedestrian Doors; 2017.

B. BHMA A156.19 - American National Standard for Power Assist and Low Energy Power Operated Doors; 2013.

C. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings:
   1. Coordinate low-energy operator submittal with the submittal for Section 08 7100 - Door Hardware.

C. Product Data: Provide data on system components, sizes, features, and finishes.

D. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and manufacturer's hardware and component templates.

E. Maintenance Data: Include manufacturer's parts list and maintenance instructions for each type of hardware and operating component.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience, and a member of AAADM.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience and approved by manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Door Operators for Swing Doors Specified in Other Sections:
   1. ASSA ABLOY Entrance Solutions; Besam PowerSwing: www.besam-usa.com.

2. LCN, an Allegion brand; 4640: www.allegion.com/us.
3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 POWER OPERATED DOORS

A. Power Operated Doors: Provide products that comply with NFPA 101 and requirements of authorities having jurisdiction; provide equipment selected for actual door weight and for light pedestrian traffic, unless otherwise indicated.
   1. Exterior Swinging Doors: Provide equipment capable of operating, closing, and holding doors closed under positive and negative differential pressure; if necessary, provide power closing.

B. Swinging Doors with Low-Energy Power Operators: Comply with BHMA A156.19; operator activated by pushing or pulling the door or by a manual actuator, not a sensor; safeties not required.
   1. Kinetic Energy of Door in Motion: 1.25 pound-force foot (1.69 Nm), maximum.
   2. Force Required to Prevent Stopped Door From Opening or Closing: 15 pound-force (67 N), maximum, measured at 1 inch (25.4 mm) from the latch edge of the door at any point in the swing cycle.
   3. Force Required to Release Latch, When Unpowered: 15 pound-force (67 N), maximum, measured at 1 inch (25.4 mm) from the latch edge of the door at any point in the swing cycle.
   4. Force Required to Set Door in Motion When Unpowered: 30 pound-force (133 N), maximum, measured at 1 inch (25.4 mm) from the latch edge of the door at any point in the closing cycle.
   5. Force Required to Fully Open Door When Unpowered: 15 pound-force (67 N), maximum, measured at 1 inch (25.4 mm) from the latch edge of the door at any point in the closing cycle.

2.03 OPERATORS FOR SWINGING DOORS SPECIFIED IN OTHER SECTIONS

A. Door Operator: Electro-hydraulic, surface mounted overhead.
   1. Operation: Low-energy power open, spring close operation.
   2. Variable speed control for opening and closing cycles.
   3. Push-Side Actuator: Push plate.
   4. Pull-Side Actuator: Push plate.
   5. Pull-Side Safety: Door-mounted.
   6. Hold Open: Toggle switch at inside head of doors.

2.04 CONTROLLERS, ACTUATORS, AND SAFETIES

A. Controller: Provide microprocessor operated controller for each door.

B. Comply with BHMA A156.10 for actuator and safety types and zones.

C. Push Plate Actuator: Momentary contact type; satin stainless steel plate; engraved with "PUSH TO OPEN" and a blue handicap logo. See door hardware schedule for mounting.

D. Swinging Door Safety Device: Door-mounted proximity detector device arranged to prevent operation of door when persons or obstructions are in the swing zone.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work and dimensions are as indicated on shop drawings.

B. Verify that electric power is available and is of the correct characteristics.

3.02 INSTALLATION

A. Install equipment in accordance with manufacturer's instructions.

3.03 ADJUSTING

A. Adjust door equipment for correct function and smooth operation.

3.04 CLEANING

A. Remove temporary protection, clean exposed surfaces.

3.05 CLOSEOUT ACTIVITIES

A. Demonstrate operation, operating components, adjustment features, and lubrication requirements.

END OF SECTION

SECTION 08 4313 - ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed storefront, with vision glass.

B. Aluminum doors and frames.

C. Weatherstripping.

1.02 RELATED REQUIREMENTS

A. Section 08 4229 - Automatic Entrances.

B. Section 08 7100 - Door Hardware: Hardware items other than specified in this section.

C. Section 08 8000 - Glazing: Glass and glazing accessories.

1.03 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.

B. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.

C. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2014 (2015 Errata).

D. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.

E. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

F. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

G. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

H. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2013.

I. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).

J. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.

K. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2016).

L. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of other components that comprise the exterior enclosure.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.

D. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.

E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F (5 degrees C). Maintain this minimum temperature during and 48 hours after installation.

1.09 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 BASIS OF DESIGN -- FRAMING FOR INSULATING GLAZING

A. Center-Set Style, Thermally-Broken <ALSTOR-1>:
   1. Basis of Design: 2 inch by 4-1/2 inch, nominal frame profile.
      a. EFCO Corporation; Series 403T; www.efcocorp.com.
      b. Kawneer Company, Inc; Trifab VersaGlaze 451T; www.kawneer.com.
      c. Oldcastle Building Envelope; Series 3000 Thermal MultiPlane; obe.com.
      d. Tubelite Inc; T14000 Series; www.tubeliteinc.com.
      e. YKK AP America Inc; YES 45 TU; www.ykkap.com.
   2. Finish: Class I color anodized.
   3. Color: Dark Bronze.

B. Center-Set Style, Not Thermally-Broken <ALSTOR-2>:
   1. Basis of Design: 1-3/4 inch by 4-1/2 inch, nominal frame profile.
      a. EFCO Corporation; Series 401; www.efcocorp.com.
      b. Kawneer Company, Inc; Trifab VersaGlaze 450; www.kawneer.com.
      c. Oldcastle Building Envelope; FG-2000; obe.com.
      d. Tubelite Inc; 4500 Series; www.tubeliteinc.com.
      e. YKK AP America Inc; YES 45 FS; www.ykkap.com.
   2. Finish: Class I natural anodized, unless noted otherwise. See drawings for more information.

2.02 BASIS OF DESIGN -- SWINGING DOORS

A. Wide Stile, Monolithic Glazing, Not Thermally-Broken:
   1. Basis of Design:
      a. EFCO Corporation; Series D500 DuraStile; www.efcocorp.com.
      b. Kawneer Company, Inc; 500 Standard Entrances; www.kawneer.com.
      c. Oldcastle Building Envelope; WS-500 Standard; obe.com.
      d. Tubelite Inc; Standard Entrance; www.tubeliteinc.com.
      e. YKK AP America Inc; 50D Standard Commercial Entrances; www.ykkap.com.

B. Wide Stile, Insulating Glazing, Thermally Broken:
   1. Basis of Design:
      a. EFCO Corporation; Series D502 ThermaStile; www.efcocorp.com.
      b. Kawneer Company, Inc; 560 Insulclad Thermal Entrances; www.kawneer.com.
      c. Oldcastle Building Envelope; Thermal Clad Entrances; obe.com.
      d. Tubelite Inc; Therml=Block Entrances; www.tubeliteinc.com.
      e. YKK AP America Inc; MegaTherm 50XT Advanced Thermal Commercial Entrances; www.ykkap.com.

2.03 ALUMINUM-FRAMED STOREFRONT

A. Aluminum-Framed Storefront <ALSTOR-1>: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Glazing Rabbet: For 1 inch (25 mm) insulating glazing.
   2. Finish: Class I color anodized.
      a. Factory finish all surfaces that will be exposed in completed assemblies.

3. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
4. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
5. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
6. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F (95 degrees C) over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
7. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
8. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
9. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glazing and heel bead of glazing compound.

B. Performance Requirements:
1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
a. Design Wind Loads: Comply with requirements of applicable code.
b. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
2. Water Penetration Resistance: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 10 psf (480 Pa).
3. Air Leakage Laboratory Test: Maximum of 0.06 cu ft/min sq ft (0.3 L/sec sq m) of wall area, when tested in accordance with ASTM E283 at 6.27 psf (300 Pa) pressure differential across assembly.
4. Condensation Resistance Factor of Framing: 60, minimum, measured in accordance with AAMA 1503.
5. Overall U-value Including Glazing: 0.36 Btu/(hr sq ft deg F), maximum.

2.04 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
1. Framing members for interior applications need not be thermally broken.
2. Glazing Stops: Flush.
3. Cross-Section: As indicated on drawings.
4. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.

B. Glazing: As specified in Section 08 8000.

C. Swing Doors: Glazed aluminum.
1. Thickness: 2 inches (50 mm), nominal.
2. Top Rail: 5 inches (127 mm) wide, nominal.
3. Vertical Stiles: 5 inches (127 mm) wide, nominal.
4. Bottom Rail: 10 inches (254 mm) wide.
5. Glazing Stops: Square.
6. Finish: Same as storefront.

2.05 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.

C. Fasteners: Stainless steel.

D. Exposed Flashings: Aluminum sheet, 20 gauge, 0.032 inch (0.81 mm) minimum thickness; finish to match framing members.

E. Concealed Flashings: Stainless steel, 26 gauge, 0.0187 inch (0.48 mm) minimum thickness.

F. Sill Flashing Sealant: Elastomeric, silicone or polyurethane, compatible with flashing material.

G. Sealant for Setting Thresholds: Non-curing butyl type.

H. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

I. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

2.06 FINISHES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils (0.018 mm) thick.

B. Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils (0.018 mm) thick.

2.07 HARDWARE

A. For each door, include weatherstripping.

B. Other Door Hardware: As specified in Section 08 7100.

C. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.

D. Automatic Door Operators and Actuators: As specified in Section 08 4229.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.

B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.02 INSTALLATION

A. Install wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.

H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

I. Install glass in accordance with Section 08 8000, using glazing method required to achieve performance criteria.

J. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inch per 3 feet (1.5 mm per m) non-cumulative or 0.06 inch per 10 feet (1.5 mm per 3 m), whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch (0.8 mm).

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general testing and inspection requirements.

B. Repair or replace storefront components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 ADJUSTING

A. Adjust operating hardware and sash for smooth operation.

3.06 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, and take care to remove dirt from corners and to wipe surfaces clean.

C. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

3.07 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

SECTION 08 4413 - GLAZED ALUMINUM CURTAIN WALLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed curtain wall, with vision glazing and glass infill panels.

1.02 RELATED REQUIREMENTS

A. Section 07 2500 - Weather Barriers: Sealing framing to weather barrier installed on adjacent construction.

B. Section 08 8000 - Glazing.

1.03 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.

B. AAMA 501.4 - Recommended Static Test Method for Evaluating Curtain Wall and Storefront Systems Subjected to Seismic and Wind Induced Interstory Drifts; 2009.

C. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.

D. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2014 (2015 Errata).

E. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.

F. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

G. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

H. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

I. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

J. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.

K. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

L. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2013.

M. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.

N. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2016).

O. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of other components that comprise the exterior enclosure.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, internal drainage details, glazing, and infill.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.

D. Samples: Submit two samples 2 x 4 inches (51 x 102 mm) in size illustrating finished aluminum surface, glazing, infill panels, and glazing materials.

E. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

F. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations; include load calculations at points of attachment to building structure.

G. Test Reports: Submit results of full-size mock-up testing. Reports of tests previously performed on the same design are acceptable.

H. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.

I. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Design curtain wall and its structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than three years of experience.

C. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F (5 degrees C). Maintain this minimum temperature during and 48 hours after installation.

1.09 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a two year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 BASIS OF DESIGN - CURTAIN WALL SYSTEMS

A. Pressure Cap Four Sides; Not Unitized, Field Assembled:
   1. Basis of Design:
      a. Oldcastle Building Envelope: Reliance TC Type II; 2-1/2 x 6 inch nominal frame profile.
      b. Tubelite: 400T Series; 2-1/2 x 6 inch nominal frame profile.
      c. YKK AP America: YCW 750 XT; 2-1/2 x 6 inch nominal frame profile.

2.02 CURTAIN WALL

A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Outside glazed, with pressure plate and mullion cover.
   2. Extended cap profiles: Basis of design: Tubelite E4TB271 or approved equal. Locations indicated on drawings.
   3. Finish: Class I Color Anodized: Dark Bronze or PVFD Color: White-locations indicated on drawings.
   4. Colors: White and Dark Bronze; as indicated on drawings.
      a. Factory finish surfaces that will be exposed in completed assemblies.
      b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
      c. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
   5. Provide flush joints and corners, weathersealed, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.

6. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
7. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
8. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel and heel bead of glazing compound.
9. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

B. Structural Performance Requirements: Design and size components to withstand the following load requirements without damage or permanent set.
1. Design Wind Loads: Comply with the requirements of ASCE 7.
a. Member Deflection: For spans less than 13 feet 6 inches (4115 mm), limit member deflection to flexure limit of glass in any direction, and maximum of 1/175 of span or 3/4 inch (19 mm), whichever is less and with full recovery of glazing materials.
b. Member Deflection: For spans over 13 feet 6 inches (4115 mm) and less than 40 feet (12.2 m), limit member deflection to flexure limit of glass in any direction, and maximum of 1/240 of span plus 1/4 inch (1/240 of span plus 6.4 mm), with full recovery of glazing materials.
2. Interstory Differential Lateral Movement: Meeting pass/fail criteria of AAMA 501.4 for Use Group I, Standard Occupancy, when tested at design displacement of 0.010 times greater adjacent story height, maximum, and 1.5 times design displacement, through three complete cycles.
3. Movement: Accommodate the following movement without damage to components or deterioration of seals:
a. Expansion and contraction caused by 180 degrees F (82 degrees C) surface temperature.
b. Expansion and contraction caused by cycling temperature range of 170 degrees F (77 degrees C) over a 12 hour period.
c. Movement of curtain wall relative to perimeter framing.
d. Deflection of structural support framing, under permanent and dynamic loads.

C. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on indoor face when tested as follows:
1. Test Pressure Differential: 10 psf (480 Pa).
2. Test Method: ASTM E331.

D. Air Leakage Laboratory Test: Maximum of 0.06 cu ft/min sq ft (0.3 L/sec sq m) of wall area, when tested in accordance with ASTM E283/E283M at 6.27 psf (300 Pa) pressure differential across assembly.

E. Thermal Performance Requirements:
1. Condensation Resistance Factor of Framing: 50, minimum, measured in accordance with AAMA 1503.
2. Overall U-value Including Glazing: 0.36 Btu/(hr sq ft deg F), maximum.

2.03 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
1. Framing members for interior applications need not be thermally broken.
2. Cross-Section: As indicated on drawings.
3. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.

B. Glazing: As specified in Section 08 8000.

C. Sill Plate: Provide a subsill plate with integral front lip. Match finish of curtain wall system.

2.04 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Sheet Aluminum: ASTM B209 (ASTM B209M).

C. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.

D. Fasteners: Stainless steel; type as required or recommended by curtain wall manufacturer.

E. Exposed Flashings: Aluminum sheet, 20 gauge, 0.032 inch (0.81 mm) minimum thickness; finish to match framing members.

F. Concealed Flashings: Sheet aluminum, 26 gauge, 0.017 inch (0.43 mm) minimum thickness.

G. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

H. Glazing Accessories: As specified in Section 08 8000.

I. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

2.05 FINISHES

A. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils (0.018 mm) thick.

B. 70% PVDF painted finish - AAMA2605.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other related work.

B. Verify that curtain wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

C. Verify that anchorage devices have been properly installed and located.

3.02 INSTALLATION

A. Install curtain wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Pressure Plate Framing: Install glazing and infill panels in accordance with Section 08 8000, using exterior dry glazing method.

H. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inches every 3 ft (1.5 mm/m) non-cumulative or 0.5 inches per 100 ft (12 mm/30 m), whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch (0.8 mm).

C. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 3/4 inch (19 mm) and minimum of 1/4 inch (6 mm).

3.04 FIELD QUALITY CONTROL

A. Provide services of curtain wall manufacturer's field representative to observe for proper installation of system and submit report.

B. See Section 01 4000 - Quality Requirements, for general testing and inspection requirements.

C. Repair or replace curtain wall components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 ADJUSTING

A. Adjust operating hardware for smooth operation.

3.06 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, take care to remove dirt from corners, and wipe surfaces clean.

C. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

3.07 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

SECTION 08 6300 - METAL-FRAMED SKYLIGHTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum skylight framing system.

B. Fasteners, anchors, reinforcement, and flashings.

1.02 RELATED REQUIREMENTS

A. Section 05 1200 - Structural Steel Framing: Structural support framing for system.

B. Section 05 5000 - Metal Fabrications: Fabricated steel attachment devices.

C. Section 06 1000 - Rough Carpentry: Wood support curbs.

D. Section 07 6200 - Sheet Metal Flashing and Trim: Skylight counterflashing.

E. Section 07 9200 - Joint Sealants: Sealing joints between skylight frames and adjacent construction.

F. Section 08 8000 - Glazing.

1.03 REFERENCE STANDARDS

A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

B. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2013.

C. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).

D. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate framed opening requirements and tolerances, spacing of members, anticipated deflection under load, affected related work, expansion and contraction joint locations and details, and sizes and locations for field welding.

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Design skylight system under direct supervision of a professional engineer experienced in design of system type specified and licensed in the State in which the Project is located.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Provide wrapping to protect prefinished aluminum surfaces. Do not use adhesive papers or spray coatings that bond when exposed to sunlight or weather.

1.07 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F (5 degrees C). Maintain this minimum temperature during and 48 hours after installation.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work, including leaks, discoloration, failure of seal at insulated glazing units, and excessive thermal or structural movement, within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design:
   1. Velux Commercial; Ridgelight: www.veluxusa.com.

2.02 METAL-FRAMED SKYLIGHTS

A. Metal Framed Skylights: Factory-fabricated, and glazed.
   1. Frame: Pultruded composite. 80% fiberglass and 20% polyurethane, 2-component polyurethane lacquer.
   2. Glazing: 6 mm float toughened; 22 mm TGI + argon; 6.76 mm 33.2 thermofloat 1,1.
   3. Cladding: Aluminum; 0.06 thickness.
   4. Color: Akzo Nobel Noir 2100 Sable YW, Granite 60 (dark grey).
   5. Fabricate to prevent vibration harmonics, thermal movement transmitted to other building elements, and loosening, weakening, or fracturing of attachments or components of system.
   6. Size: As indicated on drawings.

2.03 PERFORMANCE REQUIREMENTS

A. Provide metal-framed skylights that comply with the following:
   1. Structural Design: Design and size components to withstand dead loads and specified live loads without damage or permanent set.
   2. Wind Loads: Test in accordance with ASTM E330/E330M, using loads 1.5 times the specified design pressures and 10 second duration of maximum load.
   3. Glazing Support Member Deflection Under Wind Load: 1/180 of span, maximum.
   4. Thermal Movement: Design system to accommodate thermal expansion and contraction over ambient temperature range of 100 degrees F (38 degrees C), dynamic loading and release of loads, creep of concrete structural members and deflection of structural support framing without damage to skylight system components or loss of weathertightness.
   5. Air Leakage Laboratory Test: Limit air infiltration through assembly to 0.06 cu ft/min/sq ft (0.3 L/s/sq m) for glazed area, measured at a reference differential pressure across assembly of 1.57 pound per square foot (75 Pa) in accordance with ASTM E283.

2.04 MATERIALS

A. Aluminum Extrusions: Alloy and temper 6063-T5, 6063-T6, or 6061-T6 members complying with ASTM B221 (ASTM B221M), with minimum thickness 1/8 inch (3.2 mm) for structural members and 1/16 inch (1.6 mm) for non-structural members.

2.05 FABRICATION

A. Rigidly fit and secure joints and corners with screw and spline; fabricate rigid joints with connections that are flush, hairline, and weatherproof.

B. Fabricate components to allow for expansion and contraction with minimum clearance and shim spacing around perimeter of assembly.

C. Drain to exterior any water entering exterior joints, condensation occurring in glazing channels, or migrating moisture occurring within system.

D. Prepare components to receive concealed anchorage devices, and ensure that fasteners will be concealed upon completion of installation.

2.06 FINISHES

A. Scratch resistant powder lacquer (60-120 my).

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that structural curb is ready to receive skylight system. Coordinate installation of roofing and other adjacent work to ensure weathertight construction.

3.02 INSTALLATION

A. Install metal-framed skylights in accordance with manufacturer's instructions.

B. Set skylight structure plumb, level, and true to line, without warp or rack of frames or glazing panels. Anchor securely in place in accordance with approved shop drawings.

C. Maintain assembly dimensional tolerances, aligning with adjacent work.

D. Install base flashings in accordance with Section 07 6200.

E. Touch up damaged finishes so repair is imperceptible from 6 feet (1.8 m) distance, and remove and replace components that cannot be acceptably touched up.

3.03 CLEANING

A. Remove protective material from prefinished aluminum surfaces.

B. Wash down exposed surfaces; wipe surfaces clean.

END OF SECTION

SECTION 08 7100 - DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hardware for wood, aluminum, and hollow metal doors.

B. Hardware for fire-rated doors.

C. Electrically operated and controlled hardware.

D. Thresholds.

E. Weatherstripping and gasketing.

1.02 RELATED REQUIREMENTS

A. Section 08 1113 - Hollow Metal Doors and Frames.

B. Section 08 1416 - Flush Wood Doors.

C. Section 08 4229 - Automatic Entrances: Low-energy operators for swinging doors.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. BHMA - Builders Hardware Manufacturers Association.

C. DHI (H&S) - Sequence and Format for the Hardware Schedule; 1996.

D. DHI (KSN) - Keying Systems and Nomenclature; 1989.

E. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames; 2004.

F. DHI WDHS.3 - Recommended Locations for Architectural Hardware for Flush Wood Doors; 1993; also in WDHS-1/WDHS-5 Series, 1996.

G. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

H. ITS (DIR) - Directory of Listed Products; current edition.

I. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

J. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.

K. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

L. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2016.

M. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2018.

N. UL (DIR) - Online Certifications Directory; Current Edition.

O. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

P. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.

B. Preinstallation Meeting: Convene a preinstallation meeting one week prior to commencing work of this section; attendance is required by affected installers and the following:
   1. Architect.
   2. Installer's Architectural Hardware Consultant (AHC).
   3. Hardware Installer.
   4. Owner's Security Consultant.

C. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.

D. After receipt of approved hardware schedule, Hardware supplier shall initiate a meeting including the owner's representative to determine keying requirements. Upon completion of the initial key meeting, hardware supplier shall prepare a proposed key schedule with symbols and abbreviations as set forth in the door and hardware institute's publication "Keying Procedures, Systems, and Nomenclature". Submit copies of owner approved key schedule for review and field use in quantities as required by Division 01 - General Conditions. Wiring diagrams shall be included in final submittals transmitted for distribution and field use.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.

C. Shop Drawings - Door Hardware Schedule: Submit detailed listing that includes each item of hardware to be installed on each door. Use door numbering scheme as included in Contract Documents.
   1. Prepared by or under supervision of Architectural Hardware Consultant (AHC).
   2. Comply with DHI (H&S) using door numbers and hardware set numbers as indicated in construction documents.
      a. Submit in vertical format.
   3. List groups and suffixes in proper sequence.
   4. Provide complete description for each door listed.
   5. Provide manufacturer's and product names, and catalog numbers; include functions, types, styles, sizes and finishes of each item.
   6. Include account of abbreviations and symbols used in schedule.

D. Shop Drawings - Electrified Door Hardware: Submit diagrams for power, signal, and control wiring for electrified door hardware that include details of interface with building safety and security systems. Provide elevations and diagrams for each electrified door opening as follows:
   1. Prepared by or under supervision of Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC).
   2. Elevations: Submit front and back elevations of each door opening showing electrified devices with connections installed and an operations narrative describing how opening operates from either side at any given time.
   3. Diagrams: Submit point-to-point wiring diagram that shows each device in door opening system with related colored wire connections to each device.

E. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
   1. Submit manufacturer's parts lists and templates.
   2. Bitting List: List of combinations as furnished.

F. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

G. Maintenance Materials and Tools: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Tools: One set of each special wrench or tool applicable for each different or special hardware component, whether supplied by hardware component manufacturer or not.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.

B. Manufacturers and model numbers listed are to establish a standard of function and quality. Similar items by approved manufacturers that are equal in design, function, and quality, may be considered for prior approval of the architect, provided the required data and physical samples are submitted for approval as set forth in Division 01 - General Requirements.

C. Obtain each type of hardware (hinges, latch & locksets, exit devices, closers, etc.) from a single manufacturer, although several may be indicated as offering products complying with requirements.

D. Electrical drawings and electrical specifications are based on the specific electrified hardware components specified in hardware sets. When electronic hardware components other than those indicated in hardware sets are provided, the supplier shall be responsible for all costs incurred by the design team and their consultants to review, and revise electrical drawings and electrical specifications. Supplier shall also be responsible for any additional costs associated with required changes in related equipment, materials, installation, or final hook up to insure the system will operate and function as indicated in the construction documents, including hardware set operational / functional descriptions.

E. All hardware items shall be manufactured no earlier than 6 months prior to delivery to site.

F. Hardware supplier shall be factory trained and certified by the manufacturer to provide and support all computer managed locks and system components.

G. Hardware supplier shall participate when reasonably requested to meet with the contractor and or architect to inspect any claim for incorrect or non-functioning materials; following such inspection, the

hardware supplier shall provide a written statement documenting the cause and proposed remedy of any unresolved items.

H. Installer Qualifications: Company specializing in performing work of the type specified for commercial door hardware with at least three years of documented experience.

I. Supplier Qualifications: Company with certified Architectural Hardware Consultant (AHC) to assist in work of this section.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Warranty against defects in material and workmanship for period indicated, from Date of Substantial Completion.
   1. Closers: Ten years, minimum.
   2. Exit Devices: Three years, minimum.
   3. Locksets and Cylinders: Three years, minimum.
   4. Other Hardware: Two years, minimum.

PART 2 PRODUCTS

2.01 DESIGN AND PERFORMANCE CRITERIA

A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.

B. Provide individual items of single type, of same model, and by same manufacturer.

C. Provide door hardware products that comply with the following requirements:
   1. Applicable provisions of federal, state, and local codes.
   2. Accessibility: ADA Standards and ICC A117.1.
   3. Applicable provisions of NFPA 101.
   4. Fire-Rated Doors: NFPA 80, listed and labeled by qualified testing agency for fire protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
   5. Hardware on Fire-Rated Doors: Listed and classified by UL (DIR), ITS (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for application indicated.
   6. Hardware for Smoke and Draft Control Doors: Provide door hardware that complies with local codes, and requirements of assemblies tested in accordance with UL 1784.
   7. Listed and certified compliant with specified standards by BHMA (CPD).
   8. Hardware Preparation for Steel Doors and Steel Frames: BHMA A156.115.
   9. Hardware Preparation for Wood Doors with Wood or Steel Frames: BHMA A156.115W.
   10. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified.

D. Electrically Operated and/or Controlled Hardware: Provide necessary power supplies, power transfer hinges, relays, and interfaces as required for proper operation; provide wiring between hardware and control components and to building power connection in compliance with NFPA 70.

E. Fasteners:
   1. Provide fasteners of proper type, size, quantity, and finish that comply with commercially recognized standards for proposed applications.
      a. Aluminum fasteners are not permitted.
      b. Provide phillips flat-head screws with heads finished to match door surface hardware unless otherwise indicated.
   2. Fire-Rated Applications: Comply with NFPA 80.
      a. Provide wood or machine screws for hinges mortised to doors or frames, strike plates to frames, and closers to doors and frames.
      b. Provide steel through bolts for attachment of surface mounted closers, hinges, or exit devices to door panels unless proper door blocking is provided.
   3. Concealed Fasteners: Do not use through or sex bolt type fasteners on door panel sides indicated as concealed fastener locations, unless otherwise indicated.

2.02 MANUFACTURERS

A. Provide manufacturers, products, and product lines listed within this Section and as indicated in Section 08 7105 - Hardware Groups.

B. Substitutions: See Section 01 6000 - Product Requirements.

2.03 HINGES

A. Acceptable manufacturers and respective catalog numbers:

Butt Hinges	Ives	Stanley	Hager	McKinney
Standard Weight, Plain Bearing	5PB1	F179	1279	T2714
Standard Weight, Ball Bearing	5BB1	BB179	BB1279	TB2714
Standard Weight, Ball Bearing, Non-Ferrous	5BB1	FBB191	BB1191	TB2314
Heavy Weight, Ball Bearing	5BB1HW	FBB168	BB1168	T4B3786
Heavy Weight, Ball Bearing, Non-Ferrous	5BB1HW	FBB199	BB1199	T4B3386

Continuous Hinges	Ives	Markar	Stanley	McKinney
Edge Mount Pin & Barrel Stainless Steel	700 Series	300 Series	650 Series	300 Series

Power Transfers	Von Duprin	ASSA
Concealed Two Wire	EPT-2	CEPT-10
Concealed Ten Wire	EPT-10	CEPT-10

B. Hinges: Comply with BHMA A156.1, Grade 1.
   1. Butt Hinges: Comply with BHMA A156.1 and BHMA A156.7 for templated hinges.
      a. Provide hinge width required to clear surrounding trim.
   2. Continuous Hinges: Comply with BHMA A156.26.
      a. Continuous hinges shall be full height pin and barrel type hinge providing full height door support up to 600 lbs. Edge mount (unless noted otherwise).
      b. Construct hinges of heavy-duty 14-gauge material. The stainless internal pin shall have a diameter of 0.25 and the exterior barrel diameter of 0.438.

c. Hinge shall be non-handed with symmetrical template hole pattern and factory drilled. Hinge must accept a minimum of 21 fasteners on the door and 21 fasteners on the frame.
d. Each knuckle to be 2 inch, including split nylon bearing at each separation for quiet, smooth, self-lubricating operation.
e. Hinge to be able to carry Warnock Hersey Int. or UL for fire rated doors and frames up to 3 hours.
f. Provide machine screws for doors which have been reinforced to accept machine screws.
g. Note: Fire label for doors and frames should be placed on the header and top rail of fire rated doors and frames.

3. Provide hinges on every swinging door.
4. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
5. Provide non-removable pins on exterior outswinging doors.
6. Provide power transfer hinges where electrified hardware is mounted in door leaf.
   a. Concealed power transfers shall be concealed in the door and frame when the door is closed.
   b. Concealed power transfers shall have a steel tube to protect wires from being cut.
   c. Concealed power transfers with spring tubes shall be rejected.
   d. Concealed power transfers shall be supplied with a mud box to house all terminations.
7. Unless otherwise specified, furnish hinges for exterior doors, fabricated from brass, bronze, or stainless steel. Unless otherwise specified, hinges for interior doors may be fabricated from steel.
8. Unless otherwise specified, furnish hinges in the following sizes:
   a. 5" x 5" 2-1/4" thick doors
   b. 4-1/2" x 4-1/2" 1-3/4" thick doors
   c. 3-1/2" x 3-1/2" 1-3/8" thick doors
9. Furnish hinges with sufficient width to accommodate trim and allow for 180-degree swing.
10. Unless otherwise specified, furnish hinges with flat button tips with non-rising pins at interior doors, non-removable loose pins (NRP) at exterior and out-swinging interior doors.
11. Unless otherwise specified, furnish all hinges to template standards.
12. Unless otherwise specified, furnish hinge weight and type as follows:
    a. Standard weight: plain bearing hinge 5PB1 for interior openings through 36 inches wide without a door closer.
    b. Standard weight: ball bearing hinge 5BB1 for interior opening over 36 through 40 inches wide without a door closer, and for interior openings through 40 inches wide with a door closer.
    c. Heavyweight: 4 ball bearing hinge 5BB1HW for interior openings over 40 inches wide, and for all vestibule doors.
    d. Heavyweight: 4 ball bearing hinge 5BB1HWss for exterior openings unless otherwise listed in groups.
13. Provide following quantity of butt hinges for each door:
    a. Doors up to 60 inches (1.5 m) High: Two hinges.
    b. Doors From 60 inches (1.5 m) High up to 90 inches (2.3 m) High: Three hinges.
    c. Doors 90 inches (2.3 m) High up to 120 inches (3 m) High: Four hinges.
    d. Doors over 42 inches wide: One additional hinge.

2.04 FLUSH BOLTS

A. Acceptable manufacturers and respective catalog numbers:

	Ives	Door Controls	Hager	Rockwood
Dust Proof Strike	DP2	80	280X	570
Auto Flush Bolt	FB31P/FB41P	842/942	291D/292D	2842/2942
Constant Latch Flush Bolt	FB51P/FB61P	805/905	293D/294D	2849/2949

	Ives	Door Controls	Hager	Rockwood
Manual Flush Bolt	FB458	780	282D	555

B. Flush Bolts: Comply with BHMA A156.16, Grade 1.
   1. Flush Bolt Throw: 3/4 inch (19 mm), minimum.
   2. Provide dustproof floor strike for bolt into floor, except at metal thresholds.
   3. Unless otherwise specified, provide 12" rods for manual flush bolts for door 7'-6" or less, 24" top rods for doors over 7'-6" to 8'-6".
   4. Automatic Flush Bolts: Automatically latch upon closing of door; automatic retraction of bolts when active leaf is opened; located on inactive leaf of pair of doors.
   5. All flush-bolt applications shall be UL listed to be installed with top flush-bolt only. Provide auxiliary fire bolt as required for fire rated openings where less bottom bolt has been specified.

2.05 EXIT DEVICES

A. Acceptable manufacturers and respective catalog numbers:

	Von Duprin	Sargent	Detex
Wide Stile, Push Pad	98/99 Series	GL-43-80 Series	Advantex (Wide Stile)
Wide Stile, Electric Latch Retraction	QEL 98/99 Series	GL-43-56-80 Series	Advantex-ER (Wide Stile)
Lever Trim	996 Series	740 ET	"D/DM" Trim
Pull Trim	990 Series	800 MAL	"C" Trim

B. Exit Devices: Comply with BHMA A156.3, Grade 1.
   1. Lever design to match lockset trim.
   2. Provide cylinder with cylinder dogging or locking trim.
   3. Provide exit devices properly sized for door width and height.
   4. Provide strike as recommended by manufacturer for application indicated.
   5. Provide less bottom rod (LBR) at scheduled locations to eliminate use of floor mounted strikes.
   6. Provide UL (DIR) listed exit device assemblies for fire-rated doors and panic device assemblies for non-fire-rated doors.
   7. Obtain exit devices from a single manufacturer, although several may be indicated as offering products complying with requirements.
   8. Provide a sound-dampening feature to reduce touch pad return noise.
   9. Quiet Electric Latch Retraction shall be accomplished using a motor driven assembly, and shall incorporate the following features:
      a. Motor shall retract both the push pad assembly and latchbolt.
      b. Automatic calibration of latch throw and pull.
      c. Built-in time delay.
      d. On-board installation and troubleshooting diagnostics built into power supply and device.
      e. Retry mode if device does not pull on the first try.
   10. Provide flush end caps to reduce potential damage from impact.
   11. Provide dead-locking latch bolts to ensure security.
   12. Provide optional strikes, special length rods, and adapter plates to accommodate door and frame conditions. Provide narrow style series devices in lieu of wide stile series devices where optional strikes will not accommodate door and frame conditions.
   13. Coordinate with related trades to ensure adequate clearance and reinforcement is provided in doors and frames. Provide thru bolts as required.

14. Unless specific exit device dogging options are noted within hardware sets, provide dogging options as follows:
    a. Fire Rated devices: Dogging not permitted.
    b. Non-Rated Exit Only functions not equipped with outside trim or pull: Less Dogging.
    c. Non-Rated Classroom functions: Less Dogging.
    d. Non-Rated devices utilizing electric latch retraction or electrified outside trim: Less Dogging.
    e. All Other Non-Rated devices: Cylinder Dogging utilizing interchangeable core cylinders. Cylinder keyway shall match locksets furnished on this project.
15. Provide glass bead kits as required to accommodate door conditions. Screws shall not be visible through full glass doors.
16. Where specified, provide compatible keyed mullions with cylinder for pairs of doors.
17. Provide reinforced crossbars for all traditional style exit devices applied to doors over 36" wide.

2.06 ELECTRIC STRIKES

A. Acceptable manufacturers and respective catalog numbers:

	Von Duprin	HES
Type 1	6000 Series	1006 Series

B. Electric Strikes: Comply with BHMA A156.31, Grade 1.
1. Provide UL (DIR) listed burglary-resistant electric strike; style to suit locks.
2. Provide non-handed (verify voltage with electrical contractor) electric strike suitable for door frame material and scheduled lock configuration.
3. Provide transformer and rectifier as necessary for complete installation.

2.07 LOCK CYLINDERS

A. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.
1. Provide full size interchangeable core (FSIC) type cylinders, Grade 1, with six-pin core in compliance with BHMA A156.5 at locations indicated.
2. Provide cams and/or tailpieces as required for locking devices.
3. Within specific Door Sections, when provisions for lock cylinder are being referenced to this Section, provide specified lock cylinder and keyed to building keying system, unless otherwise indicated.

2.08 CYLINDRICAL LOCKS

A. Acceptable manufacturers and respective catalog numbers:

	Schlage	Sargent	Corbin	Best
Grade 1	ND Series SPA	11 Line LP	CL3100 PZD	9K Series 14D

B. Cylindrical Locks (Bored): Comply with BHMA A156.2, Grade 1.
1. Bored Hole: 2-1/8 inch (54 mm) diameter.
2. Latchbolt Throw: 1/2 inch (12.7 mm), minimum.
3. Backset: 2-3/4 inch (70 mm) unless otherwise indicated.
4. Strikes: Provide manufacturer's standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
    a. Finish: To match lock or latch.

5. Provide guarded latch bolts for all locksets, and latch bolts with sufficient throw to maintain fire rating of both single and paired door assemblies.
6. Length of strike lip shall be sufficient to clear surrounding trim.
7. Provide wrought boxes for strikes at inactive doors, wood frames, and metal frames without integral mortar covers.

2.09 MORTISE LOCKS

A. Acceptable manufacturers and respective catalog numbers:

	Schlage	Sargent	Corbin	Best
Grade 1	L9000 Series 17A	8200 Series LNP	ML2000 Series PS	45H Series 14H

B. Mortise Locks: Complying with BHMA A156.13, Grade 1.
1. Latchbolt Throw: 3/4 inch (19 mm), minimum.
2. Deadbolt Throw: 1 inch (25.4 mm), minimum.
3. Backset: 2-3/4 inch (70 mm) unless otherwise indicated.
4. Strikes: Provide manufacturer's standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
   a. Finish: To match lock or latch.
5. Provide guarded latch bolts for all locksets, and latch bolts with sufficient throw to maintain fire rating of both single and paired door assemblies.
6. Length of strike lip shall be sufficient to clear surrounding trim.
7. Provide wrought boxes for strikes at inactive doors, wood frames, and metal frames without integral mortar covers.

2.10 DOOR PULLS, PUSH PLATES AND PUSH BARS

A. Acceptable manufacturers and respective catalog numbers:

	Burns	Hager	Rockwood	Ives
Straight Pull (1" dia. 10" ctc)	26C	4J	111	8103-0
Straight Pull (3/4" dia. 8" ctc)	25B	3G	107	8102-8
Offset Door Pull (1" dia. 10" ctc)	39C	12J	BF157	8190-0
Pull/Push Bar (1" dia. 10" ctc Pull)	422 x 26C	153	11147	9103-0
Offset Pull/Push Bar (1" dia. 10" ctc Pull)	422 x 39C	157	BF15747	9190-0
Push Plate (0.050" 4" x 16")	54	30S 4 x 16	70C	8200 4" x 16"
Push Plate (0.050" 6" x 16")	56	30S 6 x 16	70E	8200 6" x 16"
Pull Plate (1" dia. 10" ctc - 0.050" x 6" x 16")	5426C	34J 4 x 16	111 x 70C	8303-0 4" x 16"

B. Door Pulls, Push Plates, and Push Bars: Complying with BHMA A156.6.
1. Pull Type: Straight, unless otherwise indicated.
2. Push Plate Type: Flat, with square corners, unless otherwise indicated.
   a. Edges: Beveled, unless otherwise indicated.
3. Bar Type: Push bar, unless otherwise indicated.
4. Material: Aluminum, unless otherwise indicated.

5. Adjust dimensions of push plates to accommodate stile and rail dimensions, lite and louver cutouts, and adjacent hardware. Where required by adjacent hardware, push plates shall be factory drilled for cylinders or other mortised hardware. All push plates shall be beveled 4 sides and counter sunk.
6. Where possible, provide back-to-back, and concealed mounting for pulls and push bars. Push bar length shall be 3" less door width, or center of stile to center of stile for stile & rail or full glass doors.

2.11 COORDINATORS

A. Acceptable manufacturers and respective catalog numbers:

	Ives	Door Controls	Hager	Rockwood
Bar Coordinator	COR x FL	600 x Filler	297D x 297F	2600 Series
Mounting Bracket	MB Series	AB, C Series	297 Series	2600 Series

B. Coordinators: Provide on doors having closers and self-latching or automatic flush bolts to ensure that inactive door leaf closes before active door leaf.
1. Type: Bar, unless otherwise indicated.
2. Material: Aluminum, unless otherwise indicated.
3. Ensure that coordination of other door hardware affected by placement of coordinators and carry bar is applied properly for completely operable installation.
4.

2.12 CLOSERS

A. Acceptable manufacturers and respective catalog numbers:

	LCN	Norton	Sargent	Corbin
Surface Closers	4050/4050 EDA	R7500/PR7500	351/351P10	DC8000 A10/ DC8000 A3

B. Closers: Comply with BHMA A156.4, Grade 1.
1. Type: Surface mounted to door.
2. Obtain door closers from a single manufacturer, although several may be indicated as offering products complying with requirements.
3. Provide extra heavy duty arm (EDA / HD) when closer is to be installed using parallel arm mounting.
4. Hardware supplier shall coordinate with related trades to ensure aluminum frame profiles will accommodate specified door closers.
5. Closers shall use high strength cast cylinders, forged main arms, and 1 piece forged steel pistons.
6. Closers shall utilize a stable fluid withstanding temperature range of +120 deg F to -30 deg F without seasonal adjustment of closer speed to properly close the door. Closers for fire-rated doors shall be provided with temperature stabilizing fluid that complies with standards UL10C.
7. Unless otherwise specified, all door closers shall have full covers and separate adjusting valves for sweeps, latch, and backcheck.
8. Provide closers for all labeled doors. Provide closer series and type consistent with other closers for similar doors specified elsewhere on the project.

9. Provide closers with adjustable spring power. Size closers to ensure exterior and fire rated doors will consistently close and latch doors under existing conditions. Size all other door closers to allow for reduced opening force not to exceed 5 lbs.
10. Install closers on the room side of corridor doors, stair side of stairways and interior side of exterior doors.
11. Closers shall be furnished complete with all mounting brackets and cover plates as required by door and frame conditions, and by adjacent hardware.
12. Door closers shall be provided with a powder coat finish to provide superior protection against the effects of weathering. Powder coat finish shall successfully pass a 100 hour salt spray test.
13. Pressure Relief Valve, PRV, shall not be acceptable.

2.13 OVERHEAD STOPS AND HOLDERS

A. Acceptable manufacturers and respective catalog numbers:

	Glynn-Johnson	Rixson	Sargent
Heavy Duty Surface Mount	GJ900 Series	9 Series	590
Heavy Duty Concealed Mount	GJ100 Series	1 Series	690

B. Overhead Stops and Holders (Door Checks): Comply with BHMA A156.8, Grade 1.
1. Overhead stops (including slide block and end caps) shall be fabricated from metal.
2. Unless otherwise specified, furnish GJ900 series overhead stop for doors equipped with regular arm surface type closers that swing more than 140 degrees before striking a wall, for doors that open against equipment, casework, sidelights, or other objects that would make wall bumpers inappropriate, and as specified in hardware groups.
3. Furnish sex bolt attachments for wood and mineral core doors unless doors are supplied with proper reinforcing blocks.
4. Provide special stop only (“SE” suffix) overhead stops when used in conjunction with electronic hold open closers.
5. Do not provide holder function for labeled doors.

2.14 PROTECTION PLATES

A. Acceptable manufacturers and respective catalog numbers:

	Rockwood	Hager	Ives	Hiawatha
Protection Plate	K1050	190S	8400	J102

B. Protection Plates: Comply with BHMA A156.6.
1. Where specified, provide 10" kick plates, 34" armor plates, and 4" mop plates. Unless otherwise specified, metal protective plates shall be .050" thick; plastic plates shall be 1/8" thick.
2. Protective plates shall be 2" less door width, or 1" less door width at pairs. Protection plates over 16" shall not be provided for labeled doors unless specifically approved by door manufacturers listing.
3. Where specified, provide surface mounted door edges. Edges shall butt to protective plates. Provide edges with cutouts as required adjacent hardware.
4. Adjust dimensions of protection plates to accommodate stile and rail dimensions, lite and louver cutouts, and adjacent hardware. Where required by adjacent hardware, protection plates shall be factory drilled for cylinders or other mortised hardware.

C. Metal Properties: Stainless steel.
   1. Metal, Standard Duty: Thickness 0.05 inch (1.27 mm), minimum.

D. Edges: Beveled, on four sides unless otherwise indicated.

E. Fasteners: Countersunk screw fasteners.

2.15 WALL STOPS

A. Acceptable manufacturers and respective catalog numbers:

	Ives	Hager	Burns	Rockwood
Wrought Concave Wall Bumper	WS406CCV	236W	575	409
Automatic Wall Holder	WS40	326W	533	490

B. Wall Stops: Comply with BHMA A156.16, Grade 1 and Resilient Material Retention Test as described in this standard.
   1. Furnish a stop or holder for all doors. Furnish floor stops or hinge pin stops only where specifically specified.
   2. Where wall stops are not applicable, furnish overhead stops.
   3. Do not provide holder function for labeled doors.

2.16 THRESHOLDS

A. Acceptable manufacturers and respective catalog numbers:

	Zero	Pemko	NGP	Reese
Saddle Threshold	8655	171	425	S205

B. Thresholds: Comply with BHMA A156.21.
   1. Provide threshold at each exterior door, unless otherwise indicated.
   2. Material: Aluminum.
   3. Threshold Surface: Fluted horizontal grooves across full width.
   4. Provide non-corroding fasteners at exterior locations.
   5. Hardware supplier shall verify all finish floor conditions and coordinate proper threshold as required to insure a smooth transition between threshold and interior floor finish.
   6. Threshold Types:
      a. Unless otherwise specified, provide saddle threshold similar to Zero 8655 for all exterior openings with an interior floor finish less than or equal to 1/4" in height.
      b. Unless otherwise specified, provide half saddle threshold similar to Zero 1674 for all exterior openings with an interior floor finish greater than 1/4" in height. Threshold height shall match thickness of interior floor finish.

2.17 WEATHERSTRIPPING AND GASKETING

A. Acceptable manufacturers and respective catalog numbers:

	Zero	Pemko	NGP	Reese
Weatherstrip	429	2981_PK	700NA	755

	Zero	Pemko	NGP	Reese
Adhesive Gasket	188S	S88	5050	797
Mullion Seal/Silencer	8780	5110	5100N	
Meeting Edge Seals	8193	18041	9605	959
Automatic Door Bottom	355	420APKL	320N	372A
Sweeps with Drip	8198	345_N	C627	354
Drip Cap	142	346	16	R201

B. Weatherstripping and Gasketing: Comply with BHMA A156.22.
   1. Head and Jamb Type: Adjustable.
   2. Door Sweep Type: Encased in retainer.
   3. Material: Aluminum, with brush weatherstripping.
   4. Provide gasketing (equal to Zero 188S) for smoke and draft control doors that complies with local codes, requirements of assemblies tested in accordance with UL 1784.
   5. Provide weatherstripping on each exterior door at head, jambs, and meeting stiles of door pairs, unless otherwise indicated; .
   6. Provide door bottom sweep on each exterior door, unless otherwise indicated.

2.18 KEY CONTROL SYSTEMS

A. Key Control Systems: Comply with guidelines of BHMA A156.28.
   1. Provide keying information in compliance with DHI (KSN) standards.
   2. Keying: Grand master keyed.
   3. Include control keying with removable core cylinders.
   4. Supply keys in following quantities:
      a. 1 each Grand Master keys.
      b. 2 each Control keys if new system.
      c. 2 each Change keys for each keyed core.
   5. Deliver keys with identifying tags to Owner by security shipment direct from hardware supplier.
   6. Permanent Keys and Cores: Stamped with applicable key marking for identification. Do not include actual key cuts within visual key control marks or codes. Stamp permanent keys "Do Not Duplicate."
   7. Owner or Owner's agent install permanent cores and return construction cores to hardware supplier. Construction cores and keys to remain property of hardware supplier.

2.19 KEY CABINET

A. Acceptable manufacturers and respective catalog numbers:

Lund	Key Control	Telkee
1200-1205 AA	M228-2480	RWC-AWC

B. Key Cabinet: Sheet steel construction, piano hinged door with key lock; BHMA A156.28.
   1. Mounting: Wall-mounted.
   2. Capacity: Actual quantity of keys, plus 50 percent additional capacity.
   3. Size key hooks to hold 6 keys each.
   4. Finish: Baked enamel, manufacturer's standard color.
   5. Key cabinet lock to building keying system.
   6. Furnish key cabinet complete with cam lock, permanent key tags, and change key cards.

7. Hardware supplier shall prepare all key change index records, tag all keys and place permanent file keys in cabinet.

2.20 POWER SUPPLY

A. Power Supply: Hard wired, with multiple zones providing eight (8) breakers for each output panel with individual control switches and LED's; UL (DIR) Class 2 listed.
   1. Operating Temperature: 32 to 110 degrees F (0 to 43 degrees C).
   2. 12/24 VDC Output, field selectable.
   3. Class 2 Rated power limited output.
   4. Universal 120-240 VAC input.
   5. Low voltage DC, regulated and filtered.
   6. Polarized connector for distribution boards.
   7. Fused primary input.
   8. AC input and DC output monitoring circuit w/LED indicators.
   9. Cover mounted AC Input indication.
   10. Tested and certified to meet UL294.
   11. NEMA 1 enclosure.
   12. Hinged cover w/lock down screws.
   13. High voltage protective cover.
   14. All electro-mechanical systems requiring fail safe circuits shall be capable of interfacing with the fire alarm system to cut power to appropriate system components. Unless already provided in another system component, all power supplies utilized in fail safe circuits shall include an integral relay which when connected to the N/C fire alarm contact will cut power to all openings connected to the individual power supply. Power supply, unless otherwise specified, will automatically reset itself when fire alarm relay returns to normal state following a fire alarm.

2.21 FINISHES

A. Finishes: Provide door hardware of same finish, unless otherwise indicated.
   1. Primary Finish: 626; satin chromium plated over nickel, with brass or bronze base material (former US equivalent US26D); BHMA A156.18.
   2. Secondary Finish: 630; satin stainless steel, with stainless steel 3000 series base material (former US equivalent US32D); BHMA A156.18.
      a. Use secondary finish in kitchens, bathrooms, and other spaces containing chrome or stainless steel finished appliances, fittings, and equipment; provide primary finish on one side of door and secondary finish on other side if necessary.
      b. Use secondary finish in exterior or high humidity locations.
   3. Exceptions:
      a. Where base material metal is specified to be different, provide finish that is an equivalent appearance in accordance with BHMA A156.18.
      b. Hinges for Fire-Rated Doors: Steel base material with painted finish, in compliance with NFPA 80.
      c. Door Closer Covers and Arms: Color as selected by Architect from manufacturer's standard colors unless otherwise indicated.
      d. Aluminum Surface Trim and Gasket Housings: Anodized to match door panel finish, not other hardware, unless otherwise indicated.
      e. Hardware for Aluminum Storefront Doors: Finished to match door panel finish, except at hand contact surfaces provide stainless steel with satin finish, unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and applicable codes.

B. Install hardware on fire-rated doors and frames in accordance with applicable codes and NFPA 80.

C. Install hardware for smoke and draft control doors in accordance with NFPA 105.

D. Use templates provided by hardware item manufacturer.

E. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item. As indicated in following list; unless noted otherwise in Door Hardware Schedule or on drawings.
   1. For Steel Doors and Frames: Install in compliance with DHI (LOCS) recommendations.
   2. For Wood Doors: Install in compliance with DHI WDHS.3 recommendations.
   3. Mounting heights in compliance with ADA Standards:
      a. Locksets: 40-5/16 inch (1024 mm).
      b. Push Plates/Pull Bars: 42 inch (1067 mm).
      c. Exit Devices: 40-5/16 inch (1024 mm).

F. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

3.03 ADJUSTING

A. Adjust work under provisions of Section 01 7000 - Execution and Closeout Requirements.

B. Adjust hardware for smooth operation.

C. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

3.04 CLEANING

A. Clean finished hardware in accordance with manufacturer's written instructions after final adjustments have been made.

B. Clean adjacent surfaces soiled by hardware installation.

C. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.05 PROTECTION

A. Protect finished Work under provisions of Section 01 7000 - Execution and Closeout Requirements.

B. Do not permit adjacent work to damage hardware or finish.

END OF SECTION

SECTION 08 7105 - HARDWARE GROUPS

HDWE GROUP 1.0

Qty		Description	Product Number	Manufacturer
		Hinges	As specified	IVE
1	EA	Passage Lockset	ND10S	SCH
1	EA	Wall Stop	WS406	IVE

Function:

Latch bolt by lever at all times.

HDWE GROUP 1.1

Qty		Description	Product Number	Manufacturer
		Hinges	As specified	IVE
1	EA	Passage Lockset	ND10S	SCH
1	EA	Overhead stop	90S	GLY

Function:

Latch bolt by lever at all times.

HDWE GROUP 3.0

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Classroom Lockset	ND70	SCH
1	EA	Wall Stop	WS406	IVE

Function:

Outside lever locked and unlocked by key. Inside lever always unlocked.

HDWE GROUP 4.0

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Storeroom Lock	ND80	SCH
1	EA	Wall Stop	WS406	IVE

Function:

Outside lever fixed. Entrance by key only. Inside lever always unlocked.

HDWE GROUP 4.1

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Storeroom Lock	ND80	SCH
1	EA	Overhead stop	90S	GLY

Function:

Outside lever fixed. Entrance by key only. Inside lever always unlocked.

HDWE GROUP 4.2

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Constant latch flush bolt	FB51T/FB61T	IVE
1	EA	Storeroom Lock	ND80	SCH
2	EA	Wall stop	WS406	IVE

Function:

Outside lever fixed. Entrance by key only. Inside lever always unlocked.

HDWE GROUP 5.0

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Entrance Lock	ND53	SCH
1	EA	Wall Stop	WS406	IVE

Function:

Turn/Push button locking; pushing and turning button locks outside lever requiring use of key until the button is manually unlocked. Push-button locking; pushing button locks outside lever until unlocked by key or by turning the inside lever.

Note: For Doors 235B, 305B, 307B, 324B, meeting room considered "outside".

HDWE GROUP 12.0

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Privacy w/ DB & indicator	L9496 Occupied/Vacant	SCH
1	EA	Surface Closer	4050/4050 EDA	LCN
1	EA	Kick Plate	8400 10" x 2" LDW B4E	IVE
1	EA	Wall stop	WS406	IVE

Function:

Lever retracts latchbolt from either side. Deadbolt thrown or retracted by key outside (retraction by key required in the event of an emergency) or inside thumbturn. Throwing deadbolt locks outside lever and displays "occupied" plate. Rotating inside lever simultaneously retracts both deadbolt and latchbolt and unlocks outside lever.

HDWE GROUP 14.0

Qty		Description	Product Number	Manufacturer
		Hinges	As specified	IVE
1	EA	Storeroom Lockset	ND80	SCH
1	EA	Surface Closer	4050/4050 EDA w/ hold open	LCN
1	EA	Kick Plate	8400 10" x 2" LDW B4E	IVE
1	EA	Wall Stop	WS406	IVE

Function:

Latchbolt retracted by key outside or by lever inside. Outside lever always inoperative. Auxiliary latch deadlocks latchbolt when door is closed.

HDWE GROUP 14.2

Qty		Description	Product Number	Manufacturer
		Hinges	As specified	IVE
1	EA	Storeroom Lockset	ND80	SCH

1	EA	Surface Closer	4050/4050 EDA	LCN
1	EA	Kick Plate	8400 10" x 2" LDW B4E	IVE
1	EA	Wall Stop	WS406	IVE
1	Set	Seals	188S	ZER

Function:

Latchbolt retracted by key outside or by lever inside. Outside lever always inoperative. Auxiliary latch deadlocks latchbolt when door is closed.

HDWE GROUP 14.3

Qty		Description	Product Number	Manufacturer
		Hinges	As specified	IVE
1	EA	Storeroom Lockset	ND80	SCH
1	EA	Surface Closer	4050/4050 EDA	LCN
1	EA	Kick Plate	8400 10" x 2" LDW B4E	IVE
1	EA	Overhead stop	90S	GLY
1	Set	Seals	188S	ZER

Function:

Latchbolt retracted by key outside or by lever inside. Outside lever always inoperative. Auxiliary latch deadlocks latchbolt when door is closed.

HDWE GROUP 15.0

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Entrance lock	ND53	SCH
1	EA	Surface Closer	4050/4050 EDA	LCN
1	EA	Kick Plate	8400 10" x 2" LDW B4E	IVE
1	EA	Wall Stop	WS406	IVE

Function:

Turn/Push button locking; pushing and turning button locks outside lever requiring use of key until the button is manually unlocked. Push-button locking; pushing button locks outside lever until unlocked by key or by turning the inside lever.

HDWE GROUP 18.0

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Storeroom lock	ND80	SCH
1	EA	Electric strike	6211 Fail secure	VON
1	EA	Surface Closer	4050/4050 EDA	LCN
1	EA	Kick Plate	8400 10" x 2" LDW B4E	IVE
1	EA	Wall Stop	WS406	IVE
1	EA	Card Reader	By Access Control Contractor	
1	EA	Power Supply	As required	
1	EA	Elevation drawing		
1	EA	Wire Diagram	Point to point	

Function:

Outside lever fixed. Entrance by key only. Inside lever always unlocked. Presentation of valid credential momentarily unlocks doors.

Note: Coordiate with electrical for remote "buzz in" at Doors 209, 249, 329

Note: Coordinate with electrical for remote locking from dais panic button on Door 242B.

HDWE GROUP 18.1

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Storeroom lock	ND80	SCH
1	EA	Electric strike	6211 Fail secure	VON
1	EA	Surface Closer	4050/4050 EDA	LCN
1	EA	Kick Plate	8400 10" x 2" LDW B4E	IVE
1	EA	Overhead stop	90S	GLY
1	EA	Card Reader	By Access Control Contractor	
1	EA	Power Supply	As required	
1	EA	Elevation drawing		
1	EA	Wire Diagram	Point to point	

Function:

Outside lever fixed. Entrance by key only. Inside lever always unlocked. Presentation of valid credential momentarily unlocks doors.

Note: Coordiate with electrical for remote "buzz in" at Door 306

Note: Coordinate with electrical for remote locking from dais panic button on Door 250.

HDWE GROUP 18.3

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Storeroom lock	ND80	SCH
1	EA	Electric strike	6211 Fail secure	VON
1	EA	Surface Closer	4050/4050 EDA	LCN
1	EA	Kick Plate	8400 10" x 2" LDW B4E	IVE
1	EA	Overhead stop	90S	GLY
1	Set	Seals	188S	ZER
1	EA	Card Reader	By Access Control Contractor	
1	EA	Power Supply	As required	
1	EA	Elevation drawing		
1	EA	Wire Diagram	Point to point	

Function:

Outside lever fixed. Entrance by key only. Inside lever always unlocked. Presentation of valid credential momentarily unlocks doors.

HDWE GROUP 18.4

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Storeroom lock	ND80	SCH
1	EA	Electric strike	6211 Fail secure	VON
1	EA	Surface Closer	4050/4050 EDA	LCN
1	EA	Kick Plate	8400 10" x 2" LDW B4E	IVE
1	EA	Wall Stop	WS406	IVE
1	Set	Seals	188S	ZER
1	EA	Automatic door bottom	355	ZER
1	EA	Card Reader	By Access Control Contractor	
1	EA	Power Supply	As required	
1	EA	Elevation drawing		
1	EA	Wire Diagram	Point to point	

Function:

Outside lever fixed. Entrance by key only. Inside lever always unlocked. Presentation of valid credential momentarily unlocks doors.

HDWE GROUP 19.0

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Push Plate	8200 6" x 16"	IVE
1	EA	Pull plate	8302 10" 4" x 16"	IVE
1	EA	Surface closer	4050/4050 EDA	LCN
1	EA	Kick Plate	8400 10" x 2" LDW B4E	IVE
1	EA	Wall Stop	WS406	IVE

Function:

Push/pull

HDWE GROUP 31.0

Qty		Description	Product Number	Manufacturer
		Hinges	As specified	IVE
1	EA	Panic hardware	99-L-BE	VON
1	EA	Surface Closer	4050/4050 EDA	LCN
1	EA	Kick Plate	8400 10" x 2" LDW B4E	IVE
1	EA	Wall stop	WS406	IVE

Function:

Latchbolt retracted by depressing the actuation bar. Entrance by lever, always active, no cylinder.

HDWE GROUP 31.1

Qty		Description	Product Number	Manufacturer
		Hinges	As specified	IVE
1	EA	Panic hardware	99-L-BE	VON
1	EA	Surface Closer	4050/4050 EDA w/ hold open	LCN
1	EA	Kick Plate	8400 10" x 2" LDW B4E	IVE
1	EA	Wall stop	WS406	IVE

Function:

Latchbolt retracted by depressing the actuation bar. Entrance by lever, always active, no cylinder.

HDWE GROUP 33.0

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Panic hardware	99-L	VON
1	EA	Surface Closer	4050/4050 EDA	LCN
1	EA	Kick Plate	8400 10" x 2" LDW B4E	IVE
1	EA	Wall stop	WS406	IVE

Function:

Latchbolt retracted by depressing the actuation bar. Entrance by lever. Key locks or unlocks lever.

HDWE GROUP 33.1

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Panic hardware	99-L	VON
1	EA	Surface Closer	4050/4050 EDA	LCN
1	EA	Kick Plate	8400 10" x 2" LDW B4E	IVE
1	EA	Overhead stop	90S	GLY

Function:

Latchbolt retracted by depressing the actuation bar. Entrance by lever. Key locks or unlocks lever.

HDWE GROUP 34.1

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Panic hardware	99-L-NL	VON
1	EA	Surface Closer	4050/4050 EDA	LCN
1	EA	Kick Plate	8400 10" x 2" LDW B4E	IVE
1	EA	Overhead stop	90S	IVE

Function:

Latchbolt retracted by depressing the actuation bar. Entrance by key in lever. Door relocks when key is removed from cylinder.

HDWE GROUP 38.0

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Electric strike	6100 Series	VON
1	EA	Panic hardware	LD-99-L-NL	VON
1	EA	Surface Closer	4050/4050 EDA	LCN
1	EA	Kick Plate	8400 10" x 2" LDW B4E	IVE
1	EA	Wall stop	WS406	IVE
1	EA	Card reader	By Access Control Contractor	
1	EA	Power Supply	As required	
1	EA	Elevation drawing		
1	EA	Wire Diagram	Point to point	

Function:

Latchbolt retracted inside by exit device push pad and outside by key in cylinder. Doors locks when key is removed and door is closed. Electric latch retraction controlled by card reader.

HDWE GROUP 38.1

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Electric strike	6100 Series	VON
1	EA	Panic hardware	LD-99-L-NL	VON
1	EA	Surface Closer	4050/4050 EDA w/ hold open	LCN
1	EA	Kick Plate	8400 10" x 2" LDW B4E	IVE
1	EA	Wall stop	WS406	IVE
1	EA	Card reader	By Access Control Contractor	
1	EA	Power Supply	As required	
1	EA	Elevation drawing		

1	EA	Wire Diagram	Point to point	

Function:

Latchbolt retracted inside by exit device push pad and outside by key in cylinder. Doors locks when key is removed and door is closed. Electric latch retraction controlled by card reader.

HDWE GROUP 38.2

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Power transfer	EPT2	VON
1	EA	Electric panic hardware	QEL-99-L-NL	VON
1	EA	Surface Closer	4050/4050 EDA	LCN
1	EA	Kick Plate	8400 10" x 2" LDW B4E	IVE
1	EA	Wall stop	WS406	IVE
1	EA	Card reader	By Access Control Contractor	
1	EA	Power Supply	As required	
1	EA	Elevation drawing		
1	EA	Wire Diagram	Point to point	

Function:

Latchbolt retracted inside by exit device push pad and outside by key in cylinder. Doors locks when key is removed and door is closed. Electric latch retraction controlled by card reader.

HDWE GROUP 38.3

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Power transfer	EPT2	VON
1	EA	Electric panic hardware	QEL-99-L-NL	VON
1	EA	Surface Closer	4050/4050 EDA	LCN
1	EA	Kick Plate	8400 10" x 2" LDW B4E	IVE
1	EA	Overhead stop	90S	GLY
1	EA	Card reader	By Access Control Contractor	
1	EA	Power Supply	As required	
1	EA	Elevation drawing		
1	EA	Wire Diagram	Point to point	

Function:

Latchbolt retracted inside by exit device push pad and outside by key in cylinder. Doors locks when key is removed and door is closed. Electric latch retraction controlled by card reader.

HDWE GROUP 124.0

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Storeroom lock	ND80	SCH
2	EA	Constant latch flush bolt	FB51P	IVE
1	EA	Dust proof strike	DP2	IVE
1	EA	Surface Closer	4050/4050 EDA	LCN
2	EA	Overhead stop	90S	GLY
1	EA	Kick Plate	8400 10" x 1" LDW B4E	IVE
1	EA	Rain Drip	142	ZER
1	Set	Weatherstripping	429	ZER
1	EA	Door Sweep w/ Drip	8198	ZER
1	EA	Threshold	8655	ZER
1	EA	Astragal	By door supplier	

2	EA	Door Contact	By Access Control Contractor	

Function:

Outside lever fixed. Entrance by key only. Inside lever always unlocked.

HDWE GROUP 218.1

Qty		Description	Product Number	Manufacturer
		Hinges	As required	IVE
1	EA	Storeroom lock	ND80	SCH
1	EA	Electric strike	6211 Fail secure	VON
1	EA	Surface Closer	4050/4050 EDA	LCN
1	EA	Overhead stop	90S	GLY
1	EA	Card Reader	By Access Control Contractor	
1	EA	Door Contact	By Access Control Contractor	
1	EA	Power Supply	As required	
1	EA	Elevation drawing		
1	EA	Wire Diagram	Point to point	

Function:

Outside lever fixed. Entrance by key only. Inside lever always unlocked. Presentation of valid credential momentarily unlocks doors.

HDWE GROUP 248.0

Qty		Description	Product Number	Manufacturer
1	EA	Continuous hinge	700 x EPT	IVE
1	EA	Continuous hinge	700	IVE
1	EA	Power Transfer	EPT10	VON
1	EA	Keyed Removable Mullion	KR4954	VON
1	EA	Electric Panic Hardware	QEL+-99-NL-OP	VON
1	EA	Panic hardware	99-EO	VON
1	EA	Door pull, 1" round	8103 10"	IVE
2	EA	OH Stop	100S	GLY
2	EA	Surface Closer	4050/4050 EDA	LCN
1	EA	Card Reader	By Access Control Contractor	
2	EA	Door Contact	By Access Control Contractor	
1	EA	Power Supply	As required	
1	EA	Elevation drawing		
1	EA	Wire Diagram	Point to Point	

Function:

Latchbolt retracted inside by device push pad and outside by key in cylinder. Door locks when key is removed. Valid credential will momentarily unlock the door. Door relocks when card reader times out.

HDWE GROUP 269.0

Qty		Description	Product Number	Manufacturer
1	EA	Continuous hinge	700	IVE
2	EA	Pull/push bar	9103-0	IVE
1	EA	Surface auto operator	4642	LCN
2	EA	Actuator, wall mount	8310-853	LCN
1	EA	Surface closer	4050/4050 EDA	LCN
2	EA	Overhead stop	100S	GLY

Function:

Push/pull

HDWE GROUP 348.0

Qty		Description	Product Number	Manufacturer
1	EA	Continuous hinge	700 x EPT	IVE
1	EA	Continuous hinge	700	IVE
1	EA	Power Transfer	EPT10	VON
1	EA	Keyed Removable Mullion	KR4954	VON
1	EA	Electric Panic Hardware	QEL+-99-NL-OP	VON
1	EA	Panic hardware	99-EO	VON
1	EA	Door pull, 1" round	8103 10"	IVE
2	EA	OH Stop	100S	GLY
2	EA	Surface Closer	4050/4050 EDA	LCN
1	EA	Rain Drip	142A	ZER
1	Set	Weather Strip	By Door Manufacturer	
1	EA	Mullion Seal	8780	ZER
2	EA	Door Sweep w/Drip	8198	ZER
1	EA	Threshold	8655	ZER
1	EA	Card Reader	By Access Control Contractor	
2	EA	Door Contact	By Access Control Contractor	
1	EA	Power Supply	As required	
1	EA	Elevation drawing		
1	EA	Wire Diagram	Point to Point	

Function:

Latchbolt retracted inside by device push pad and outside by key in cylinder. Door locks when key is removed. Valid credential will momentarily unlock the door. Door relocks when card reader times out.

HDWE GROUP 368.0

Qty		Description	Product Number	Manufacturer
2	EA	Continuous hinge	700 x EPT	IVE
2	EA	Power Transfer	EPT10	VON
1	EA	Keyed Removable Mullion	KR4954	VON
1	EA	Electric Panic Hardware	QEL+-99-NL-OP	VON
1	EA	Electric Panic Hardware	QEL-99-EO	VON
2	EA	Door pull, 1" round	8103 10"	IVE
1	EA	OH Stop	100S	GLY
1	EA	Surface auto operator	4642	LCN
2	EA	Actuator	8310 Series wireless actuator, transmitter & receiver	LCN
1	EA	Surface Closer	4050/4050 EDA	LCN
1	EA	Rain Drip	142A	ZER
1	Set	Weather Strip	By Door Manufacturer	
1	EA	Mullion Seal	8780	ZER
2	EA	Door Sweep w/Drip	8198	ZER
1	EA	Threshold	8655	ZER
1	EA	Card Reader	By Access Control Contractor	
2	EA	Door Contact	By Access Control Contractor	
1	EA	Power Supply	As required	
1	EA	Elevation drawing		
1	EA	Wire Diagram	Point to Point	

Function:

Latchbolt retracted inside by device push pad and outside by key in cylinder. Door locks when key is removed. Valid credential will momentarily unlock the door. Door relocks when card reader times out.

END OF SECTION

SECTION 08 8000 - GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Insulating glass units.

B. Glazing units.

C. Plastic sheet glazing units.

D. Plastic films.

E. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 2500 - Weather Barriers.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.

B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015.

C. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2015).

D. ASTM C1036 - Standard Specification for Flat Glass; 2016.

E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.

F. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

G. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2015.

H. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2016.

I. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2010.

J. GANA (GM) - GANA Glazing Manual; 2008.

K. GANA (SM) - GANA Sealant Manual; 2008.

L. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (2016).

M. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2017.

N. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2014, with Errata (2017).

O. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2017.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data on Insulating Glass Unit and Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.

C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.

D. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with GANA (GM), GANA (SM), GANA (LGRM), and IGMA TM-3000 for glazing installation methods.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.06 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 40 degrees F (4 degrees C).

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Float Glass Manufacturers:
   1. Cardinal Glass Industries: www.cardinalcorp.com.
   2. Guardian Glass, LLC: www.guardianglass.com.
   3. Oldcastle Building Envelope: obe.com.
   4. Pilkington North America Inc: www.pilkington.com/na/#sle.
   5. Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com/#sle.
   6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
   1. Design Pressure: Calculated in accordance with applicable codes.
   2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
   3. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
   4. Glass thicknesses listed are minimum.

B. Vapor Retarder and Air Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier.
   1. In conjunction with vapor retarder and joint sealer materials described in other sections.
      a. Refer to Section 07 2500.
   2. To utilize the inner pane of multiple pane insulating glass units for the continuity of the vapor retarder and air barrier seal.
   3. To maintain a continuous vapor retarder and air barrier throughout the glazed assembly from glass pane to heel bead of glazing sealant.

C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
   1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
   2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
   3. Solar Optical Properties: Comply with NFRC 300 test method.

2.03 GLASS MATERIALS

A. Float Glass: Provide float glass based glazing unless otherwise indicated.
   1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality - Q3.
   2. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
   3. Kind FT - Fully Tempered Type: Complies with ASTM C1048.
   4. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.

2.04 INSULATING GLASS UNITS

A. Manufacturers:
   1. Cardinal Glass Industries: www.cardinalcorp.com.
   2. Guardian Glass, LLC: www.guardianglass.com.
   3. Oldcastle Building Envelope: obe.com.
   4. Pilkington North America Inc: www.pilkington.com/na.
   5. Viracon, Apogee Enterprises, Inc: www.viracon.com.
   6. Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com/#sle.
   7. Substitutions: See Section 01 6000 - Product Requirements.

B. Insulating Glass Units: Types as indicated.
   1. Durability: Certified by an independent testing agency to comply with ASTM E2190.

2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
3. Warm-Edge Spacers: Flexible silicone with polyisobutylene (PIB) primary seal.
    a. Spacer Width: As required for specified insulating glass unit.
    b. Spacer Height: 0.27 inch (6.85 mm).
4. Spacer Color: Black.
5. Edge Seal:
    a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.
6. Color: Black.
7. Purge interpane space with dry air, hermetically sealed.

C. Insulating Glass Units <INSUL TEMP GL-1>: Vision glass, double glazed.
1. Applications: Exterior glazing unless otherwise indicated.
2. Space between lites filled with argon.
3. Outboard Lite: Fully tempered float glass, 1/4 inch (6.4 mm) thick, minimum.
    a. Tint: As selected by Architect.
    b. Coating: Low-E (passive type), on #2 surface.
        1) Basis of Design:
            (a) VNE1-63 by Viracon.
            (b) PPG Industries: Solarban 70XL.
            (c) Guardian Industries: SunGuard SNX 62/27.
4. Inboard Lite: Fully tempered float glass, 1/4 inch (6.4 mm) thick, minimum.
    a. Tint: As selected by Architect.
5. Total Thickness: 1 inch (25.4 mm).
6. Thermal Transmittance (U-Value), Winter - Center of Glass: 0.25, minimum.
7. Visible Light Transmittance (VLT): 62 percent, minimum.
8. Solar Heat Gain Coefficient (SHGC): 28, maximum.
9. Visible Light Reflectance, Outside: 10 percent, maximum.
10. Glazing Method: Dry glazing method, gasket glazing.

D. Insulating Glass Units <INSUL GL-40>: Spandrel glazing.
1. Applications: Exterior spandrel glazing unless otherwise indicated.
2. Space between lites filled with argon.
3. Outboard Lite: Fully tempered float glass, 1/4 inch (6.4 mm) thick, minimum.
    a. Tint: As selected by Architect.
    b. Coating: Same as on vision units, on #2 surface.
4. Inboard Lite: Fully tempered float glass, 1/4 inch (6.4 mm) thick.
    a. Tint: As selected by Architect.
    b. Opacifier: Ceramic frit, on #3 surface.
    c. Opacifier Color: As selected by Architect.
5. Total Thickness: 1 inch (25.4 mm).

E. Insulating Glass Units: Safety glazing.
1. Applications:
    a. Glazed lites in exterior doors.
    b. Glazed sidelights and panels next to doors.
    c. Other locations required by applicable federal, state, and local codes and regulations.
    d. Other locations where the material ID includes <INSUL TEMP-#>.
2. Space between lites filled with argon.

3. Glass Type: Same as other vision glazing except use fully tempered float glass for both outboard and inboard lites.
4. Total Thickness: 1 inch (25.4 mm).

2.05 GLAZING UNITS

A. Monolithic Safety Glazing: Non-fire-rated.
1. Applications:
a. Glazed lites in doors, except fire doors.
b. Glazed sidelights to doors, except in fire-rated walls and partitions.
c. Other locations required by applicable federal, state, and local codes and regulations.
d. Other locations indicated on drawings.
2. <TEMP GL-1> Glass Type: Fully tempered safety glass as specified.
a. Thickness: 1/4 inch (6.4 mm), nominal.
3. <LAM GL-1> Glass Type: Laminated safety glass as specified.
a. Thickness: 9/16 inches (14.3 mm).
4. Tint: Clear.

B. Transparent One-Way Mirror <ONEWAY GL-1>: Mirror quality float glass with pyrolytic (hard coat) type coating located on high light level surface of glass; ASTM C1376.
1. Applications: Locations as indicated on drawings.
2. Thickness: 1/4 inch (6 mm).
3. Glass Tint: Grey.
4. Glass Type: Fully tempered.
5. Lighting Ratio: Maintain at least 8:1 lighting level ratio between coated side (bright-observed side) and uncoated side (dim-observer side).

2.06 PLASTIC FILMS

A. Decorative Plastic Film <FILM-1>: Polyvinyl Chloride (PVC).
1. Basis of Design: 3M Crystal Glass Finishes 7725SE-324, frosted crystal: www.3m.com.
2. Application: Locations as indicated on drawings.
3. Thickness: 3.2 mil.

2.07 GLAZING COMPOUNDS

A. Manufacturers:
1. BASF Corporation: www.basf.com/us/en.html.
2. Bostik Inc: www.bostik-us.com.
3. Dow Corning Corporation: www.dowcorning.com/construction.
4. Momentive Performance Materials, Inc: www.momentive.com.
5. Pecora Corporation: www.pecora.com.
6. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
7. Substitutions: See Section 01 6000 - Product Requirements.

2.08 ACCESSORIES

A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot (25 mm for each square meter) of glazing or minimum 4 inch (100 mm) by width of glazing rabbet space minus 1/16 inch (1.5 mm) by height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch (75 mm) long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.

C. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.

D. Steel Glass Clamp Glass Adapter Standoff: See drawings for product information.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

C. Verify that sealing between joints of glass framing members has been completed effectively.

D. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.

B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.

C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.

D. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.

E. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.

F. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, etc.

3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)

A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.

B. Place setting blocks at 1/4 points with edge block no more than 6 inch (152 mm) from corners.

C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.

D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.05 CLEANING

A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.

B. Remove non-permanent labels immediately after glazing installation is complete.

C. Clean glass and adjacent surfaces after sealants are fully cured.

D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.06 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION

SECTION 09 2116 - GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.

B. Metal stud wall framing.

C. Metal channel ceiling framing.

D. Acoustic insulation.

E. Gypsum sheathing.

F. Gypsum wallboard.

G. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 2500 - Weather Barriers: Water-resistive barrier over sheathing.

B. Section 07 8400 - Firestopping: Top-of-wall assemblies at fire-resistance-rated walls.

C. Section 07 9200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

1.03 REFERENCE STANDARDS

A. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2015.

B. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014, with Editorial Revision (2015).

C. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2017.

D. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2017.

E. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2017a.

F. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2014a.

G. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2013.

H. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2013.

I. ASTM C1280 - Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing; 2013a.

J. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.

K. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2016.

L. GA-216 - Application and Finishing of Gypsum Panel Products; 2016.

M. GA-600 - Fire Resistance Design Manual; 2015.

N. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on metal framing, gypsum board, glass mat faced gypsum board, accessories, and joint finishing system.

C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

B. Fire-Resistance-Rated Assemblies: Provide completed assemblies with the following characteristics:
   1. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL (FRD).

2.02 METAL FRAMING MATERIALS

A. Manufacturers - Metal Framing, Connectors, and Accessories:
   1. ClarkDietrich: www.clarkdietrich.com/#sle.
   2. Marino: www.marinoware.com.
   3. Phillips Manufacturing Co: www.phillipsmfg.com/#sle.
   4. SCAFCO Corporation: www.scafco.com/#sle.
   5. Steel Construction Systems: www.steelconsystems.com/#sle.
   6. Substitutions: See Section 01 6000 - Product Requirements.

B. Non-structural Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf (L/120 at 240 Pa).
   1. Studs: "C" shaped with flat or formed webs with knurled faces.
      a. <MET STUD-2>: Provide 20 gauge studs unless noted otherwise.
   2. Runners: U shaped, sized to match studs.
   3. Furring Members <FUR-1>: Hat-shaped sections, minimum depth of 7/8 inch (22 mm).
   4. Furring <FUR-2>: 'Z' furring channels. See drawings for depth.
   5. Furring <FUR-3>: 1-1/2 inch (38 mm) cold rolled furring channel.

C. Shaft Wall Studs and Accessories: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 and specified performance requirements.
   1. C-H Studs <MET STUD-5>: Gauge as required by UL listing.

2.03 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
   1. CertainTeed Corporation: www.certainteed.com/#sle.
   2. Georgia-Pacific Gypsum: www.gpgypsum.com/#sle.
   3. National Gypsum Company: www.nationalgypsum.com/#sle.
   4. USG Corporation: www.usg.com/#sle.
   5. Substitutions: See Section 01 6000 - Product Requirements.

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Material ID:
      a. <GYP BD-1>: 5/8 inch Type X.
   2. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
   3. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
   4. Paper-Faced Products:
      a. USG Corporation: Sheetrock Brand Gypsum Panels.
      b. National Gypsum Company: Gold Bond Gypsum Panels.
      c. CertainTeed Gypsum: ProRoc.
      d. Georgia-Pacific Gypsum; ToughRock: www.gpgypsum.com/#sle.
      e. Substitutions: See Section 01 6000 - Product Requirements.

C. Backing Board For Wet Areas: One of the following products:
   1. Application: Surfaces behind tile in wet areas including tub and shower surrounds and shower ceilings where indicated as <GYP BD-1>.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   3. Glass Mat Faced Board <GYP BD-16>: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.
      a. Regular Type: Thickness 5/8 inch (16 mm).
      b. Products:
         1) CertainTeed Corporation; Diamondback 5/8" Type X Tile Backer: www.certainteed.com/#sle.
         2) Georgia-Pacific Gypsum; DensShield Tile Backer: www.gpgypsum.com/#sle.
         3) National Gypsum Company; Gold Bond eXP Tile Backer: www.nationalgypsum.com/#sle.
         4) USG Corporation: Durock Brand Glass Mat Tile Backer Board.
         5) Substitutions: See Section 01 6000 - Product Requirements.

D. Backing Board For Non-Wet Areas <GYP BD-6>: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M; sizes to minimum joints in place; ends square cut.
   1. Application: Vertical surfaces behind thinset tile, except in wet areas.
   2. Type X Thickness: 5/8 inch (16 mm).
   3. Edges: Tapered.
   4. Products:
      a. Georgia-Pacific Gypsum; ToughRock Mold-Guard Gypsum Board: www.gpgypsum.com/#sle.
      b. National Gypsum Company; Gold Bond XP Gypsum Board: www.nationalgypsum.com/#sle.

c. USG Corporation: Sheetrock Brand Mold Tough.
d. CertainTeed Gypsum: Moisture and Mold Resistant.
e. Substitutions: See Section 01 6000 - Product Requirements.

E. Exterior Sheathing Board <GYP SHTG-1>: Sizes to minimize joints in place; ends square cut.
1. Application: Exterior sheathing, unless otherwise indicated.
2. Glass Mat Faced Sheathing: Glass mat faced gypsum substrate as defined in ASTM C1177/C1177M.
3. Core Type: Type X.
4. Type X Thickness: 1/2 inch (13 mm).
5. Edges: Square.
6. Glass Mat Faced Products:
a. CertainTeed Corporation; GlasRoc Type X Exterior Sheathing: www.certainteed.com/#sle.
b. Georgia-Pacific Gypsum; DensGlass Sheathing: www.gpgypsum.com/#sle.
c. National Gypsum Company; Gold Bond eXP Sheathing: www.nationalgypsum.com/#sle.
d. USG Corporation; USG Securock Brand Ultralight Glass-Mat Sheathing: www.usg.com/#sle.
e. Substitutions: See Section 01 6000 - Product Requirements.

F. Shaftwall and Coreboard <GYP BD-20>: Type X; 1 inch (25 mm) thick by 24 inches (610 mm) wide, beveled long edges, ends square cut.
1. Paper-Faced Type: Gypsum shaftliner board or gypsum coreboard as defined ASTM C1396/C1396M; water-resistant faces.
2. Glass Mat Faced Products:
a. CertainTeed Corporation; GlasRoc Shaftliner Type X: www.certainteed.com/#sle.
b. Georgia-Pacific Gypsum; DensGlass Shaftliner (mold-resistant): www.gpgypsum.com/#sle.
c. National Gypsum Company; Gold Bond Brand eXP Shaftliner: www.nationalgypsum.com/#sle.
d. USG Corporation; USG Sheetrock Brand Glass-Mat Liner Panels Mold Tough: www.usg.com/#sle.
e. Substitutions: See Section 01 6000 - Product Requirements.

2.04 Gypsum Wallboard ACCESSORIES

A. Acoustic Insulation <INSUL-80>: ASTM C665; preformed mineral fiber, friction fit type, unfaced. Thickness: 3-1/2 inch (84 mm), minimum. Insulation should fill the cavity.

B. Backing Plate <MET BLKG-1>: Metal backing plate. 20 gauge. Width and length as required for application.

C. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.

D. Water-Resistive Barrier: As specified in Section 07 2500.

E. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.
1. Types: As detailed or required for finished appearance, locations as indicated on drawings.
2. Basis of Design: Fry Reglet: www.fryreglet.com.
a. Drywall Reveal Molding: White.
b. Corner Trim: White.

F. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
1. Tape: 2 inch (50 mm) wide, coated glass fiber tape for joints and corners.

2. Tape: 2 inch (50 mm) wide, creased paper tape for joints and corners.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 SHAFT WALL INSTALLATION

A. Shaft Wall Framing: Install in accordance with GA-600 requirements.
   1. Fasten runners to structure with short leg to finished side, using appropriate power-driven fasteners at not more than 24 inches (600 mm) on center.

B. Shaft Wall Liner: Cut panels to accurate dimensions and install sequentially between special friction studs.
   1. On walls over sixteen feet high, screw-attach studs to runners top and bottom.
   2. Seal perimeter of shaft wall and penetrations with acoustical sealant.

3.03 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.

C. Studs: Space studs at 16 inches on center (at 406 mm on center).
   1. Extend partition framing to structure where indicated and to ceiling in other locations.
   2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.

D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

E. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches (100 mm) from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches (600 mm) on center.

F. Furring for Fire-Resistance Ratings: Install as required for fire-resistance ratings indicated and to GA-600 requirements.

3.04 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
   1. Place continuous bead at perimeter of each layer of gypsum board.
   2. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

3.05 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
   1. Exception: Tapered edges to receive joint treatment at right angles to framing.

C. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

D. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
   1. Paper-Faced Sheathing: Immediately after installation, protect from weather by application of water-resistive barrier.

E. Installation on Metal Framing: Use screws for attachment of gypsum board.

3.06 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
   1. Not more than 30 feet (10 meters) apart on walls and ceilings over 50 feet (16 meters) long.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.07 JOINT TREATMENT

A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, embed and finish with setting type joint compound.

B. Paper Faced Gypsum Board: Use paper joint tape, embed with drying type joint compound and finish with drying type joint compound.

C. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
   2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   3. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
   4. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction.

D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch (0.8 mm).

E. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.08 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet (3 mm in 3 m) in any direction.

END OF SECTION

SECTION 09 3000 - TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for floor applications.

B. Tile for wall applications.

C. Non-ceramic trim.

1.02 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.

1.03 REFERENCE STANDARDS

A. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2013 (Revised).

B. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation; 2010 (Reaffirmed 2016).

C. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes For Thin-Set Ceramic Tile And Dimension Stone Installation; 2014.

D. ANSI A118.15 - American National Standard Specifications for Improved Modified Dry-Set Cement Mortar; 2012.

E. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2012.

F. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2017.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

C. Samples: Provide two tiles, actual size, illustrating pattern and color.

D. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.

2. Extra Tile: 10 square feet (1 square meters) of each size, color, and surface finish combination.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.07 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.

B. Maintain ambient and substrate temperature above 50 degrees F (10 degrees C) and below 100 degrees F (38 degrees C) during installation and curing of setting materials.

1.08 WARRANTY

A. Tile and Stone Installation System Warranty: Manufacturer's standard system warranty protecting against break down or deterioration of the tile setting system under normal usage, and ensuring the products are free from manufacturer defects. Manufacturer shall pay for replacement of its own products and replacement of finishing materials, including labor, for defective portions of the project.
   1. Warranty Period: 25 years.

PART 2 PRODUCTS

2.01 TILE

A. Ceramic Tile: ANSI A137.1, standard grade.
   1. <T-#>: See drawings for product information.

2.02 TRIM AND ACCESSORIES

A. Non-Ceramic Trim: Brushed stainless steel, style and dimensions to suit application, for setting using tile mortar or adhesive.
   1. Applications:
      a. Floor transitions <MT-1>: Schluter SCHIENE or approved equal; Anodized Satin Nickel Aluminum (AT).
      b. Wall corners outside <MT-2>: Schluter QUADEC or approved equal; Anodized Satin Nickel Aluminum (AT).
      c. Floor to wall transition <MT-3>: Schluter DILEX-AHK or approved equal; Anodized Satin Nickel Aluminum (AT).
      d. Stair Treads <MT-4>: Schluter TREP-E/-EK; Brushed Stainless Steel (AT).
   2. Manufacturers:
      a. Schluter-Systems: www.schluter.com/#sle.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.03 SETTING MATERIALS

A. Improved Latex-Portland Cement Mortar Bond Coat: ANSI A118.15.
   1. Applications: Use this type of bond coat where indicated, and where no other type of bond coat is indicated.
      a. Typical Floors:
         1) LATICRETE 254 Platinum.
         2) TEC Specialty Full Flex.
      b. Typical Walls:

1) LATICRETE Tri Lite.
2) TEC Specialty Ultimate Large Tile.

2. Products:
   a. LATICRETE International, Inc: www.laticrete.com/#sle.
   b. Mapei Corporation: www.mapei.com.
   c. TEC, an H.B. Fuller Construction Products Brand: www.tecspecialty.com/#sle.
   d. Substitutions: See Section 01 6000 - Product Requirements.

2.04 GROUTS

A. Manufacturers:
   1. LATICRETE International, Inc: www.laticrete.com/#sle.
   2. TEC, an H.B. Fuller Construction Products Brand: www.tecspecialty.com/#sle.
   3. Mapei Corporation: www.mapei.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. High Performance Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.
   1. Applications: Use this type of grout for typical walls.
   2. Use sanded grout for joints 1/8 inch (3.2 mm) wide and larger; use unsanded grout for joints less than 1/8 inch (3.2 mm) wide.
   3. Color(s): As selected by Architect from manufacturer's full line.
   4. Basis of Design:
      a. LATICRETE International, Inc; LATICRETE PERMACOLOR Select Grout: www.laticrete.com/#sle.
      b. TEC, an H.B. Fuller Construction Products Brand; TEC Power Grout: www.tecspecialty.com/#sle.
      c. Substitutions: See Section 01 6000 - Product Requirements.

C. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
   1. Applications: See below.
   2. Color(s): As selected by Architect from manufacturer's full line.
   3. Basis of Design:
      a. Other Tile Floors:
         1) LATICRETE International, Inc; LATICRETE SpectraLOCK PRO Premium Grout.
         2) TEC Specialty; Epoxy AccuColor EFX.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.05 MAINTENANCE MATERIALS

A. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.
   1. Applications: Between tile and plumbing fixtures.
   2. Color(s): As selected by Architect from manufacturer's full line.
   3. Products:
      a. LATICRETE International, Inc; LATICRETE LATASIL: www.laticrete.com/#sle.
      b. TEC Specialty; Silicone Caulk.
      c. Substitutions: See Section 01 6000 - Product Requirements.

2.06 ACCESSORY MATERIALS

A. Waterproofing Membrane: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.

1. Application: Provide at walls and ceilings in showers only. Provide at all floors.
2. Fluid or Trowel Applied Type:
    a. Products:
        1) LATICRETE International, Inc; LATICRETE HYDRO BAN: www.laticrete.com/#sle.
        2) TEC Specialty; HydraFlex.
        3) Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.

D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

D. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.03 INSTALLATION - GENERAL

A. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

B. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

C. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

D. Form internal angles square and external angles bullnosed.

E. Install non-ceramic trim in accordance with manufacturer's instructions.

F. Sound tile after setting. Replace hollow sounding units.

G. Keep control and expansion joints free of mortar, grout, and adhesive.

H. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

I. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.

J. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F115, with epoxy grout. Provide waterproofing membrane under all tile.
   1. Use uncoupling membrane under all tile unless other underlayment is indicated.

3.05 INSTALLATION - SHOWERS AND BATHTUB WALLS

A. At walls install in accordance with TCNA (HB) Method B412, over cementitious backer units with waterproofing membrane.

B. Grout with polymer modified grout.

3.06 CLEANING

A. Clean tile and grout surfaces.

3.07 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION

SECTION 09 5100 - ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Divisions 21 through 28 for mechanical and electrical components in acoustical ceilings.

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.

B. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2017.

C. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2013.

D. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2017.

E. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Do not install acoustical units until after interior wet work is dry.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on suspension system components and acoustical units.

C. Samples: Submit two samples 4 x 6 inch (100 x 150 mm) in size illustrating material and finish of acoustical units.

D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Acoustical Units: Quantity equal to 5 percent of total installed.

1.06 QUALITY ASSURANCE

A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.07 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F (16 degrees C), and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acoustic Tiles/Panels:
   1. Armstrong World Industries, Inc: www.armstrongceilings.com/#sle.
   2. CertainTeed Corporation: www.certainteed.com/#sle.
   3. USG Corporation: www.usg.com/ceilings/#sle.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Suspension Systems:
   1. Armstrong World Industries, Inc: www.armstrongceilings.com/#sle.
   2. CertainTeed Corporation: www.certainteed.com/#sle.
   3. Rockfon, LLC: www.rockfon.com.
   4. USG Corporation: www.usg.com/ceilings/#sle.
   5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ACOUSTICAL UNITS

A. Acoustical Units - General: ASTM E1264, Class A.
   1. VOC Content: As specified in Section 01 6116.

B. Ceiling Acoustical Panels <ACT-1>: Painted mineral fiber, with the following characteristics:
   1. Classification: ASTM E1264 Type III.
      a. Form: 1, nodular.
      b. Pattern: "E" - lightly textured.
   2. Size: 24 by 24 inches (610 by 610 mm).
   3. Thickness: 3/4 inch (19 mm).
   4. Panel Edge: Reveal.
   5. Suspension System: Exposed grid.
   6. Basis of Design:
      a. USG Corporation; Eclipse Acoustical Panels: www.usg.com/ceilings/#sle.

C. Ceiling Acoustical Panels <WD CLG-1>: Particle board with face-cut veneers; species: walnut.
   1. Classification: ASTM E1264 Type XX - Fire Class A.
   2. Size: 24 by 96 inches (610 x 2439 mm).
   3. Thickness: 3/4 inch (19 mm).
   4. Perforations: W4 Round Straight.
   5. Color: Custom stain to match Wilsonart Kingswood Walnut.

6. Manufacturer's standard acoustic infill material above wood panels.
7. Basis of Design:
    a. Armstrong; Woodworks Concealed Ceilings: www.armstrongceilings.com.

D. Wall Acoustical Panels <WD PNL-1>: Particle board with face-cut veneers; species: walnut.
1. Classification: Class A ASTM E84.
2. Size: 24 by 96 inches (610 x 2439 mm).
3. Thickness: 3/4 inch (19 mm).
4. Installation Method: Z-Clips (by supplier).
5. Color: Custom stain to match Wilsonart Kingswood Walnut.
6. Basis of Design:
    a. Armstrong; Woodworks Walls: www.armstrongceilings.com.

2.03 SUSPENSION SYSTEM(S)

A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold down clips, stabilizer bars, clips, and splices as required.
1. Materials:
    a. Steel Grid: ASTM A653/A653M, G30 coating, unless otherwise indicated.

B. Exposed Suspension System: Hot-dipped galvanized steel grid with aluminum cap.
1. Structural Classification: Intermediate-duty, when tested in accordance with ASTM C635/C635M.
2. Profile: Tee; 15/16 inch (24 mm) face width.
3. Finish: Baked enamel.
4. Color: White.

C. Exposed Suspension System: Hot-dipped galvanized steel grid and cap.
1. Structural Classification: Intermediate-duty, when tested in accordance with ASTM C635/C635M.
2. Profile: Tee; 9/16 inch (14 mm) face width.
3. Finish: Baked enamel.
4. Color: White.

D. Particle Board Suspension System: Aluminum Z-Clip by Supplier.

2.04 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.

B. Hanger Wire: 12 gauge, 0.08 inch (2 mm) galvanized steel wire.

C. Hold-Down Clips: Manufacturer's standard clips to suit application.

D. Perimeter Moldings: Same metal and finish as grid.
1. Size: As required for installation conditions.
2. Angle Molding: L-shaped, for mounting at same elevation as face of grid.

E. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. Locate system on room axis according to reflected plan.

D. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.
   2. Miter corners.

E. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

H. Support fixture loads using supplementary hangers located within 6 inches (152 mm) of each corner, or support components independently.

I. Do not eccentrically load system or induce rotation of runners.

3.03 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

E. Cutting Acoustical Units:
   1. Make field cut edges of same profile as factory edges.
   2. Double cut and field paint exposed reveal edges.

F. Where round obstructions occur, provide preformed closures to match perimeter molding.

G. Install hold-down clips on panels within 20 ft (6 m) of an exterior door.

H. No ceiling panel to be cut to less than 6 inches width at ceiling panel installation.

I. At conditions where ceiling tile pads exceed 24 inches (610 mm) trim, 24 x 48 inch (610 x 1220 mm) pads as required to fit.

3.04 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet (3 mm in 3 m).

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

SECTION 09 6500 - RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient tile flooring.

B. Static control resilient tile flooring.

C. Resilient base.

D. Resilient stair accessories.

E. Installation accessories.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 03 3000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied resilient flooring.

C. Section 26 0526 - Grounding and Bonding for Electrical Systems: Grounding and bonding of static control flooring to building grounding system.

1.03 REFERENCE STANDARDS

A. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2017.

B. ASTM F1344 - Standard Specification for Rubber Floor Tile; 2015.

C. ASTM F2195 - Standard Specification for Linoleum Floor Tile; 2013.

D. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2015.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

C. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.

D. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Flooring Material: 100 square feet (9.29 square meters) of each type and color.
   3. Extra Wall Base: 20 linear feet (6.1 linear meters) of each type and color.

4. Extra Stair Materials: Quantity equivalent to 5 percent of each type and color.

1.05 FIELD CONDITIONS

A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F (21 degrees C) to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F (13 degrees C).

1.06 WARRANTY

A. Manufacturer's standard limited 5 year commercial warranty.

PART 2 PRODUCTS

2.01 TILE FLOORING

A. Rubber Tile <RBT-#>: Type I- Homogeneous, color and pattern throughout thickness; Type II- Heterogeneous, laminated.
   1. Basis of Design: See drawings for product information.
   2. Minimum Requirements: Comply with ASTM F1344, of Class corresponding to type specified.
   3. Total Thickness: 0.14 inch (3.5 mm) minumum.

B. Luxury Vinyl Tile <LVT-#>: Homogeneous wear layer bonded to backing, with color and pattern through wear layer thickness.
   1. Basis of Design: See drawings for product information.
   2. Minimum Requirements: Comply with ASTM 1700, Class 3 Type B.
   3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
   4. Backing: Synthetic fabric.
   5. Thickness: 0.100 inch (2.5 mm), minimum, excluding backing.

C. Static Dissipative Resilient Tile <ESD-1>:
   1. Basis of Design: See drawings for product information.

2.02 STAIR COVERING

A. Stair Treads <RST-#>: Rubber; full width and depth of stair tread in one piece; tapered thickness.
   1. Basis of Design: See drawings for product information.
   2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
   3. Nosing: Square.

B. Stair Risers: Full height and width of tread in one piece, matching treads in material and color.
   1. Thickness: 0.080 inch (2.0 mm).

2.03 RESILIENT BASE

A. Resilient Base <RB-#>:
   1. Basis of Design: See drawings for product information.
   2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
   3. Length: Roll.

2.04 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.

C. Moldings, Transition and Edge Strips: Same material as resilient base, color to match.

D. Copper Grounding Strips: Type and size as recommended by static control flooring manufacturer.

E. Filler for Coved Base: Plastic.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.

C. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
   1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor filler to achieve smooth, flat, hard surface.

B. Prohibit traffic until filler is fully cured.

C. Clean substrate.

D. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.03 Installation - General

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install in accordance with manufacturer's written instructions.

C. Adhesive-Applied Installation:
   1. Spread only enough adhesive to permit installation of materials before initial set.
   2. Place copper grounding strip in conductive adhesive and apply additional adhesive to top side of strip before installing static control flooring. Allow strip to extend beyond flooring in accordance

with static control flooring manufacturer's instructions. Refer to Section 26 0526 for grounding and bonding to building grounding system.

3. Fit joints and butt seams tightly.
4. Set flooring in place, press with heavy roller to attain full adhesion.

D. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

E. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.04 Installation - Tile Flooring

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

B. Lay flooring with joints and seams parallel to building lines to produce symmetrical pattern, unless indicated otherwise in drawings.

3.05 Installation - Resilient Base

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches (45 mm) between joints.

B. Install base on solid backing. Bond tightly to wall and floor surfaces.

C. Scribe and fit to door frames and other interruptions.

3.06 Installation - Stair Coverings

A. Install stair coverings in one piece for full width and depth of tread.

B. Adhere over entire surface. Fit accurately and securely.

3.07 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

3.08 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

SECTION 09 6623 - RESINOUS MATRIX TERRAZZO FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Epoxy matrix terrazzo with ground and polished finish.

B. Divider strips.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete subfloor with steel trowel finish.

B. Section 09 9600 - High-Performance Coatings: Slip resistant coating applied to terrazzo flooring.

1.03 REFERENCE STANDARDS

A. NTMA (GRAD) - Aggregate Gradation Standards; Current Edition.

B. NTMA (EPOXY) - Epoxy Terrazzo Specifications; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for divider strips, control joint strips, expansion joints, and sealer; include printed copy of current NTMA recommendations for type of terrazzo specified.

C. Shop Drawings: Indicate divider strip and control and expansion joint layout, and details of adjacent components. For precast units, detail profile and anchorage requirements.

D. Samples: Submit two samples, 12 inch (304 mm) by 12 inch (305 mm) in size illustrating color, chip size and variation, chip gradation, matrix color, and typical divider strip.

E. Cleaning and Maintenance Data: Include procedures for stain removal, stripping, and sealing.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with NTMA recommendations as posted at their web site at www.ntma.com.

B. Installer Qualifications: Company specializing in performing the type of work specified in this section.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store terrazzo materials in a dry, secure area.

B. Maintain minimum temperature of 60 degrees F (16 degrees C).

C. Keep products away from fire or open flame.

1.07 FIELD CONDITIONS

A. Do not install terrazzo when temperature is below 50 degrees F (10 degrees C) or above 90 degrees F (32 degrees C).

B. Maintain temperature within specified range 24 hours before, during, and 72 hours after installation of flooring.

C. Provide ambient lighting level of 50 ft candles (540 lx), measured at floor surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Resinous Matrix Terrazzo Flooring:
   1. Key Resin Company: www.keyresin.com/#sle.
   2. Sherwin-Williams Company: General Polymers Brand: www.generalpolymers.com/#sle.
   3. Terrazzo & Marble Supply Companies: www.tmsupply.com/#sle.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 EPOXY MATRIX TERRAZZO APPLICATIONS

A. Floors <TERR-#>:
   1. Basis of Design: See drawings for product information.

2.03 MATERIALS

A. Epoxy Matrix Terrazzo: Aggregate and matrix mix applied to substrate, troweled flat, and ground smooth.
   1. Mix Proportions: As required to achieve appearance specified.

B. Matrix: Two component resin and epoxy hardener with mineral filler and color pigment, non-volatile, thermo-setting.

C. Aggregate: Type as indicated; sized in accordance with NTMA aggregate gradation standards; color(s) as indicated, uniform in color.

D. Finishing Grout: Epoxy, color to match terrazzo matrix.

2.04 ACCESSORIES

A. Divider Strips: 1/8 inch (3 mm) thick zinc exposed top strip, zinc coated steel concealed bottom strip, with anchoring features.

B. Control Joint Strips: 1/8 inch (3 mm) nominal width zinc exposed top strips, zinc coated steel concealed bottom strips, 1/8 inch (3 mm) wide neoprene filler strip between vertical strips, with anchoring features.

C. Divider and Control Joint Strip Height: To suit thickness of terrazzo topping, with allowance for grinding.

D. Crack Suppression Membrane: Provide manufacturer's recommended crack suppression system under all terrazzo.

E. Base Cap, Base Divider Strip, and Separator Strip: Match divider strips.

F. Non-Slip Inserts: Provide channel-shaped inserts filled with a mixture of resin and fine, abrasive aggregate.

G. Sealer: Colorless, non-yellowing, penetrating liquid type to completely seal matrix surface; not detrimental to terrazzo components.

H. Wood Subfloor Filler: Latex type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive terrazzo.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive terrazzo.

C. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of materials to subfloor surfaces.

D. Cementitious Subfloor Surfaces: Verify that substrates are ready for terrazzo flooring installation by testing for moisture and alkalinity (pH).
   1. Obtain instructions if test results are not within limits recommended by terrazzo flooring manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Clean substrate of foreign matter.

B. Prepare concrete subfloor by mechanically abrading surface in accordance with manufacturer's instructions.

C. Apply primer in accordance with manufacturer's instructions.

3.03 INSTALLATION

A. Install control joint strips straight and flat to locations indicated.

B. Install divider strips according to pattern approved on shop drawings.

C. Install base and border divider and control joint strips to match floor pattern.

D. Install terminating cap strip at top of base; attach securely to wall substrate.

E. Place terrazzo mix over substrate to thickness indicated.

3.04 FINISHING

A. Finish terrazzo to NTMA requirements.

B. Produce terrazzo finish surface to match approved mock-up, with 70 percent chip exposed.

C. Grind terrazzo surfaces with power disc machine; sequence with coarse to fine grit abrasive, using a wet method or using a dry grinder with vacuum to control dust.

D. Apply grout to fill voids exposed from grinding.

E. Remove grout coat by grinding, using a fine grit abrasive.

F. Hand grind vertical and curved surfaces similarly.

3.05 TOLERANCES

A. Maximum Variation from Flat Surface: 1/4 inch in 10 feet (6 mm in one m).

B. Maximum Variation from Level (Except Surfaces Sloping to Drain): 1/8 inch (3 mm).

3.06 CLEANING

A. Scrub and clean terrazzo surfaces with neutral pH cleaner in accordance with manufacturer's instructions. Let dry.

B. Immediately after terrazzo has dried, apply sealer in accordance with manufacturer's instructions.

C. Polish surfaces in accordance with manufacturer's instructions.

3.07 PROTECTION

A. Protect finished terrazzo from damage due to subsequent construction until Date of Substantial Completion.

END OF SECTION

SECTION 09 6813 - TILE CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Carpet tile, fully adhered.

1.02 REFERENCE STANDARDS

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

C. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.

D. Manufacturer's Installation Instructions: Indicate special procedures.

E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.

B. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience.

1.05 FIELD CONDITIONS

A. Store materials in area of installation for minimum period of 24 hours prior to installation.

PART 2 PRODUCTS

2.01 MATERIALS

A. Tile Carpeting <CPT-#>: Tufted, manufactured in one color dye lot.
   1. Basis of Design: See drawings for product information.

2.02 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.

B. Edge Strips: Rubber, color as selected by Architect.

C. Adhesives:
   1. Compatible with materials being adhered; maximum VOC content of 50 g/L; CRI (GLP) certified; in lieu of labeled product, independent test report showing compliance is acceptable.

D. Carpet Tile Adhesive: Recommended by carpet tile manufacturer; releasable type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.

B. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.

C. Cementitious Subfloor Surfaces: Verify that substrates are ready for flooring installation by testing for moisture and alkalinity (pH).
   1. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.

D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

B. Remove subfloor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with subfloor filler.

C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.

D. Vacuum clean substrate.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install carpet tile in accordance with manufacturer's instructions.

C. Blend carpet from different cartons to ensure minimal variation in color match.

D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.

E. Trim carpet tile neatly at walls and around interruptions.

F. Complete installation of edge strips, concealing exposed edges.

3.04 CLEANING

A. Remove excess adhesive without damage, from floor, base, and wall surfaces.

B. Clean and vacuum carpet surfaces.

END OF SECTION

SECTION 09 6900 - ACCESS FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Adjustable height access flooring systems.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 03 3000 - Cast-in-Place Concrete: Requirements for floor flatness and levelness.

1.03 REFERENCE STANDARDS

A. ASTM E2322 - Standard Test Method for Conducting Transverse and Concentrated Load Tests on Panels used in Floor and Roof Construction; 2003 (Reapproved 2015).

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

C. CISCA (AF) - Recommended Test Procedures for Access Floors; 2007.

D. ICC (IBC) - International Building Code; 2018.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's data sheets including loading capacities, materials, finishes, dimensions of components, profiles, and accessories.

C. Shop Drawings: Indicate floor layout, appurtenances or interruptions, edge details, ramps.

D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Materials: Supply an additional 5 (five) percent of access flooring system components.
   3. Panel Lifting Devices: One, of manufacturer's standard type.

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Design floor system structure layout for this project under direct supervision of a Professional Structural Engineer experienced in design of floors of the type required and licensed in the State in which the Project is located.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Access Flooring - Adjustable Height:
   1. ASM Modular Systems, Inc: www.asmproducts.com/#sle.
   2. Global IFS: www.global IFS.com/#sle.
   3. Tate Access Floors, Inc: www.tateaccessfloors.com/#sle.

4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

A. General: Comply with the following system requirements and as indicated for specified components.
   1. Test in accordance with CISCA (AF).
   2. Structural Design Live Loads: Comply with requirements of ICC (IBC).
      a. Uniformly Distributed Loads: In compliance with ICC (IBC) Table 1607.1, for access floor systems.
   3. Lateral Stability: Design system for lateral stability in all directions, with or without panels in place.

B. Uniform Load: 300 pounds per square foot (1465 kg/sq m), when tested in accordance with CISCA (AF) and ASTM E2322.
   1. Maximum Deflection: 0.04 inch (1 mm).

C. Concentrated Load: Over an area of 1 inch by 1 inch (25 mm by 25 mm), 1250 pounds (567 kg) at any location, when tested in accordance with CISCA (AF).
   1. Maximum Deflection: 0.04 inch (1 mm).
   2. Permanent Deformation: 0.02 inch (0.5 mm) maximum at design load.

D. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 75, maximum; when tested in accordance with ASTM E84.

2.03 ACCESS FLOORING - ADJUSTABLE HEIGHT

A. Factory-fabricated system consisting of removable floor panels and supporting understructure that allows access to space below floor without requiring removal of panels other than the one directly above the space to which access is needed; provide components and accessories required for complete installation.
   1. Basis of Design: Tate Access Floors, Inc; Concore 1250 Access Floor Panel: www.tateinc.com.

B. Configuration:
   1. Lay-in panels on bolted stringer understructure.

C. Components:
   1. Pedestal Assembly:
      a. Material: Steel.
      b. Finish: Manufacturer's standard.
      c. Base: Manufacturer's standard shape and size in accordance with system performance requirements.
      d. Column: Threaded supporting rod to permit 1-1/2 inch (38 mm) adjustment.
      e. Head: Manufacturer's standard shape and size to accept specified configuration.
      f. Maximum Pedestal Axial Load: 4400 pounds (1996 kg) without permanent deformation, when tested in accordance with CISCA (AF).
   2. Stringers: Steel channels, box, or tee sections.
      a. Stringer Load: 225 pounds (102 kg), with a permanent set not to exceed 0.010 inch (0.254 mm), when tested in accordance with CISCA (AF).
   3. Floor Panels:
      a. Construction:
         1) Die formed galvanized steel top and bottom plates; steel reinforcement stiffeners.
   4. Carpet Floor Covering: Tate PosiTile Carpet <ACCESS-FLOR-CPT #>: Color/Placement: As indicated on drawings.

5. Floor Covering <ACCESS-FLOR-LVT>: Color/Placement: As indicated on drawings.
6. ESD Vinyl Floor Covering: Tate ESD Vinyl <ACCESS-FLOR-ESD>: Color/Placement: As indicated on drawings.

2.04 ACCESSORIES - Adjustable HEIGHT

A. Ramps: Same materials, structural strength, and construction as floor panels; flush extruded aluminum cover plates at junction with floor system.

B. Gaskets: Closed cell sponge rubber, preformed to suit.

C. Stairs. Same materials, structural strength, and construction as floor panels, flush extruded aluminum cover plates at junction with floor system.

D. Sealant: Any water-based, moisture-curing, or chemically-curing joint sealant suitable for purpose and compatible with materials being sealed; except acrylic latex emulsion.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify field measurements are as instructed by the manufacturer.

B. Verify that substrates comply with tolerances, dimensioned clearances, and other requirements specified in other sections, and that substrates are clean, dry, and free of conditions and deleterious substances that might interfere with system installation.

C. Verify substrates comply with minimum subfloor flatness (FF) and subfloor levelness (FL) as specified in Section 03 3000.

D. Verify that required utilities are available, in proper location, and are ready for use.

E. Start of installation constitutes acceptance of project conditions.

3.02 INSTALLATION - Adjustable HEIGHT ACCESS FLOORING

A. Install components in accordance with manufacturer's instructions.

B. Secure pedestal base plate to subfloor with adhesive.

C. Install stringers and floor panels on pedestals with full bearing.

3.03 TOLERANCES

A. Maximum Out of Level Floor Panel Tolerance: 1/16 inch in 10 ft (1.6 mm in 3 m), non-cumulative.

3.04 ADJUSTING

A. Adjust pedestals to achieve a level floor and to assure adjacent floor panel surfaces are flush.

3.05 PROTECTION

A. Do not permit traffic over unprotected floor surface.

END OF SECTION

SECTION 09 7200 - WALL COVERINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Wall covering.

1.02 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on wall covering and adhesive.

C. Shop Drawings: Indicate wall elevations with seaming layout.

D. Proofs: Submit sample proofs illustrating color, finish and texture prior to fabrication.

E. Manufacturer's Installation Instructions: Indicate special procedures.

F. Maintenance Data: Submit data on cleaning, touch-up, and repair of covered surfaces.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Wall Covering Materials: 25 linear feet (8 linear m) of each color and pattern of wall covering; store where directed.
   3. Package and label each roll by manufacturer, color and pattern, and destination room number.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Inspect roll materials at arrival on site, to verify acceptability.

B. Protect packaged adhesive from temperature cycling and cold temperatures.

C. Do not store roll goods on end.

1.06 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the adhesive or wall covering product manufacturer.

B. Maintain these conditions 24 hours before, during, and after installation of adhesive and wall covering.

PART 2 PRODUCTS

2.01 Wall Coverings

A. General Requirements:
   1. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.

B. Wall Covering <WC-#>: Fabric-backed vinyl roll stock.
   1. Basis of Design: See drawings for product information.

C. Adhesive: Type recommended by wall covering manufacturer to suit application to substrate.

D. Substrate Filler: As recommended by adhesive and wall covering manufacturers; compatible with substrate.

E. Substrate Primer and Sealer: Alkyd enamel type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work, and conform to requirements of the wall covering manufacturer.

B. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet (3 mm in 3 m) nor vary at a rate greater than 1/16 inch/ft (1.5 mm/300 mm).

3.02 PREPARATION

A. Fill cracks in substrate and smooth irregularities with filler; sand smooth.

B. Wash impervious surfaces with tetra-sodium phosphate, rinse and neutralize; wipe dry.

C. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

D. Apply one coat of primer sealer to substrate surfaces. Allow to dry. Lightly sand smooth.

E. Vacuum clean surfaces free of loose particles.

3.03 INSTALLATION

A. Apply adhesive and wall covering in accordance with manufacturer's instructions.

B. Apply adhesive to wall surface immediately prior to application of wall covering.

C. Razor trim edges on flat work table. Do not razor cut on gypsum board surfaces.

D. Apply wall covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface.

E. Butt edges tightly.

F. Horizontal seams are not acceptable.

G. Do not seam within 2 inches (50 mm) of internal corners or within 6 inches (150 mm) of external corners.

H. Install wall covering before installation of bases and items attached to or spaced slightly from wall surface.

I. Do not install wall covering more than 1/4 inch (6 mm) below top of resilient base.

J. Cover spaces above and below windows, above doors, in pattern sequence from roll.

K. Remove excess adhesive while wet from seam before proceeding to next wall covering sheet. Wipe clean with dry cloth.

3.04 CLEANING

A. Clean wall coverings of excess adhesive, dust, dirt, and other contaminants.

B. Reinstall wall plates and accessories removed prior to work of this section.

3.05 PROTECTION

A. Do not permit construction activities at or near finished wall covering areas.

END OF SECTION

SECTION 09 8430 - SOUND-ABSORBING WALL AND CEILING UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sound-absorbing panels.

1.02 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's printed data sheets for products specified.

C. Shop Drawings: Fabrication and installation details, panel layout, and fabric orientation.

D. Verification Samples: Fabricated samples of each type of panel specified; 12 by 12 inch (305 by 305 mm), showing construction, edge details, and fabric covering.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company with not less than five years of experience in manufacturing acoustical products similar to those specified.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect acoustical units from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until units are needed for installation.

B. Store units flat, in dry, well-ventilated space; do not stand on end.

C. Protect edges from damage.

PART 2 PRODUCTS

2.01 FABRIC SOUND-ABSORBING UNITS

A. Manufacturers:
   1. MDC Interior Solutions: www.mdcwall.com.
   2. Essi Acoustical Products Company: www.essiacoustical.com/#sle.
   3. Owens Corning Conwed Designscape: www.conweddesignscape.com/#sle.
   4. TECHLITE: www.techlite.com/#sle.
   5. Zintra: www.zintraacoustic.com.
   6. Substitutions: See Section 01 6000 - Product Requirements.

B. General:
   1. Prefinished, factory assembled covered panels.
   2. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.

C. Fabric Acoustical Panels for Ceilings <FWP-#>:
   1. Basis of Design: See drawings for product information.
   2. Mounting Method: Back-mounted with mechanical fasteners.

2.02 FABRICATION

A. General: Fabricate panels to sizes and configurations as indicated, with fabric facing installed without sagging, wrinkles, blisters, or visible seams.

B. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 inch (1.6 mm) for thickness, overall length and width, and squareness from corner to corner.

2.03 ACCESSORIES

A. Back-Mounting Accessories: Manufacturer's standard accessories for concealed support, designed to allow panel removal, and as follows:
   1. Two-part clip and base-support bracket system; brackets designed to support full weight of panels and clips designed for lateral support, with one part mechanically attached to back of panel and the other attached to substrate.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates for conditions detrimental to installation of acoustical units. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install acoustical units in locations as indicated, following manufacturer's installation instructions.

B. Align panels accurately, with edges plumb and top edges level. Scribe to fit accurately at adjoining work and penetrations.

C. Install acoustical units to construction tolerances of plus or minus 1/16 inch (1.6 mm) for the following:
   1. Plumb and level.
   2. Flatness.
   3. Width of joints.

3.03 CLEANING

A. Clean fabric facing upon completion of installation from dust and other foreign materials, following manufacturer's instructions.

3.04 PROTECTION

A. Provide protection of installed acoustical panels until Date of Substantial Completion.

B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

END OF SECTION

SECTION 09 8453 - SOUND BARRIER MULLION TRIM CAP

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sound barrier mullion trim caps providing sound transmission control at storefront.

1.02 RELATED REQUIREMENTS:

A. Section 07 9200 - Joint Sealants

B. Section 08 4413 - Aluminum-Framed Storefronts

C. Section 09 2116 - Gypsum Board Assemblies for interior wall construction

1.03 SUBMITTALS

A. Product Data:
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for sound barrier wall end cap system.

B. Shop Drawings:
   1. Include typical dimensioned cross-section(s) at the location where drywall partition terminates at the perimeter curtain wall, indicating:
      a. Dimensions
      b. Finish

C. Samples: For each exposed product and for each color and texture specified.
   1. Size: 6 inch (152 mm) sound barrier mullion trim cap sample and 2” x3-1/2” (51 mm x 89 mm) custom color paint sample.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer of aluminum extrusions and anodizing shall be ISO-9001 certified.

B. Installer Qualifications: An entity that employs installers and supervisors who are approved by manufacturer.

C. Testing Agency Qualifications: ASTM E 90 testing to be performed by laboratory accredited by IAS as complying with ISO/IEC Standard 17025.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver sound barrier mullion trim caps until spaces to receive them are clean, dry, and ready for their installation.

B. Store sound barrier mullion trim caps in original undamaged packaging inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1.06 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace sound barrier mullion trim caps that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: Ten years limited warranty from date of Substantial Completion.
   2. Limited warranty does not cover adjacent products or improper installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Products:
   1. Basis of Design: Gordon-Inc; Mullion Mate: www.gordon-inc.com.
   2. MULL-it-OVER Products; Sound barrier mullion trim cap systems: www.mullitoverproducts.com.
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SYSTEM DESCRIPTION

A. General: Provide sound barrier mullion trim caps of design, basic profile, materials, and operation indicated. Provide units with capability to accommodate variations in adjacent surfaces.
   1. Furnish units in lengths of sufficient additional length to allow for field trimming to required length to match variations in construction tolerances of adjacent systems.

2.03 PERFORMANCE REQUIREMENTS

A. Sound Transmission:
   1. Single Sided Installations: STC 50 or higher.
   2. Double-Sided Installations: STC 55 or higher.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
   1. Mullion trim cap to be sized to accommodate thermal movement.

2.04 SOUND BARRIER MULLION TRIM CAP

A. Sound Barrier Mullion Trim Cap <ACST TRIM-1>:
   1. Products: Gordon-Inc. Mullion Mate; Mullion Trim Cap.

2.05 COMPONENTS

A. Aluminum Extrusions:
   1. Thickness: 0.125 inches.
   2. Profile: As selected and approved by Architect to allow solid attachment and fastening to the partition wall framing.

B. Sound Absorbing Foam:
   1. Resistant to smoke, flame, and microbial growth.
   2. Fire Rating: ASTM E 84 Class 1.
   3. Fungi Resistance: Zero rating per ASTM G 21.

C. Compressible Foam: Between edge of extrusion and interior face of curtain wall glass.
   1. Thickness: Standard 1/2 inch (12.7 mm), or 1 inch (25.4 mm) to accommodate a larger mullion deflection.

2. Color: As selected from manufacturer's full range.

D. Fasteners:
   1. Self Tapping or appropriate threaded fastener.
   2. Compatible with all materials fasteners will contact with and not causing galvanic corrosion.

E. Snap Cover: Snap-on fastener cover.

F. Acoustical Sound Sealant: Acrylic latex based.

2.06 ACCESSORIES

A. Provide necessary and related parts and tools to complete installation.

2.07 FABRICATION

A. Extrusions and generic profiles to be shipped in custom lengths as required to meet project requirements or shipped in standard incremental foot lengths and cut to exact length on jobsite.

2.08 FINISHES

A. Exposed surfaces of exposed aluminum extrusion:
   1. Standard Finish: Color anodized finish; dark bronze.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine walls and adjacent curtain wall for suitable conditions where sound barrier wall end cap will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Measure and cut sound barrier wall end cap to proper lengths.

B. Notch around horizontal mullions, sills, or other obstructions leaving appropriate gap for differential movement between the sound barrier wall end cap and the obstruction.

C. Apply continuous bead of acoustical sealant to the unexposed side of extruded aluminum surface that will be in contact with the drywall edge.

D. Place sound barrier wall end cap on the vertical surface of the drywall partition wall and loosely install fasteners in the top and bottom slotted holes of the wall end cap.

E. Plumb the wall end cap leaving recommended gap spacing between the interior glass surface and the wall end cap. Foam gasket to be in contact with glass.

F. Tighten top and bottom fasteners to secure end cap.

G. Install additional fasteners at 12 inches on center, minimum.

H. Install snap cover to conceal fasteners.

I. Apply color matched sealant at joints of dissimilar materials as desired.

3.03 CLEANING

A. After work is complete in adjacent areas, clean exposed surfaces with suitable cleaner that will not harm or attack the finish.

3.04 PROTECTION

A. Protect sound barrier wall end caps from damage during installation, general construction activities, and until turnover of structure.

END OF SECTION

SECTION 09 9113 - EXTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished unless noted otherwise including, but not limited to, the following.
   1. Exposed surfaces of steel lintels and ledge angles.
   2. Mechanical and Electrical:
      a. Exterior mechanical and electrical: Paint all mechanical and electrical pipes, conduits, etc that penetrate exterior building walls, except as indicated below in paragraph D.

D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Stainless steel, anodized aluminum, bronze, terne coated stainless steel, zinc, and lead.
   6. Floors, unless specifically indicated.
   7. Glass.
   8. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 09 9123 - Interior Painting.

C. Divisions 21 through 26: Identification for mechanical and electrical systems.

1.03 REFERENCE STANDARDS

A. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2016.

B. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

C. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

D. SSPC-SP 2 - Hand Tool Cleaning; 1982, with Editorial Revision (2004).

E. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

F. SSPC-SP 13 - Surface Preparation of Concrete; 1997 (Reaffirmed 2003).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches (216 by 279 mm) in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.
   2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens definitely not required.
   3. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as masonry, have been approved.

D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.

E. Manufacturer's Instructions: Indicate special surface preparation procedures.

F. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Paint and Finish Materials: 1 gallon (4 L) of each color, type, surface texture, and sheen; from the same product run, store where directed.
   3. Label each container with color in addition to the manufacturer's label.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five years experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.07 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior paint and finishes during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Minimum Application Temperatures for Latex Paints: 50 degrees F (10 degrees C) for exterior; unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.

B. Paints:
   1. Benjamin Moore & Co: www.benjaminmoore.com.
   2. Diamond Vogel Paints: www.diamondvogel.com/#sle.
   3. PPG Paints: www.ppgpaints.com/#sle.
   4. Pratt & Lambert Paints: www.prattandlambert.com.
   5. Sherwin-Williams Company: www.sherwin-williams.com/#sle.

C. Primer Sealers: Same manufacturer as top coats.

D. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready mixed, unless required to be a field-catalyzed paint.
   1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
   3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
   4. Supply each paint material in quantity required to complete entire project's work from a single production run.
   5. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. Volatile Organic Compound (VOC) Content: Comply with Section 01 6116.

C. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.

D. Colors: To be selected from manufacturer's full range of available colors.
   1. Selection to be made by Architect after award of contract.
   2. Allow for minimum of six colors for each system, unless otherwise indicated, without additional cost to Owner.
   3. Extend colors to surface edges; colors may change at any edge as directed by Architect.

2.03 PAINT SYSTEMS - EXTERIOR

A. Paint E-OP - Exterior Surfaces to be Painted, Unless Otherwise Indicated: Including concrete, concrete masonry units, primed wood, and primed metal.
   1. Two top coats and one coat primer.
   2. Top Coat(s): Exterior Latex; MPI #10, 11, 15, 119, or 214.
   3. Primer: As recommended by top coat manufacturer for specific substrate.
   4. Masonry: One coat of block filler as recommended by top coat manufacturer for specific substrate.

2.04 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of paints and finishes until substrates have been properly prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

E. Test shop-applied primer for compatibility with subsequent cover materials.

F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
   2. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

F. Concrete:
   1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
   2. Prepare surface as recommended by top coat manufacturer and according to SSPC-SP 13.

G. Masonry:
   1. Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.
   2. Prepare surface as recommended by top coat manufacturer.

H. Galvanized Surfaces:
   1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
   2. Prepare surface according to SSPC-SP 2.

I. Ferrous Metal:
   1. Solvent clean according to SSPC-SP 1.
   2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.
   3. Remove rust, loose mill scale, and other foreign substances using using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

J. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied. Back prime concealed surfaces before installation.

K. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.

C. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

E. Apply each coat to uniform appearance.

F. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply additional coats until complete hide is achieved.

G. Sand wood and metal surfaces lightly between coats to achieve required finish.

H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 09 9123 - INTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
   1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
   2. Prime surfaces to receive wall coverings.
   3. Mechanical and Electrical:
      a. In finished areas, paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
      b. In finished areas, paint shop-primed items.
      c. Paint interior surfaces of air ducts and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
      d. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.

D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
   5. Stainless steel, anodized aluminum, bronze, terne coated stainless steel, and lead items.
   6. Floors, unless specifically indicated.
   7. Ceramic and other tiles.
   8. Glass.
   9. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 09 9113 - Exterior Painting.

C. Divisions 21 through 26: Identification for mechanical and electrical systems.

1.03 REFERENCE STANDARDS

A. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2016.

B. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

C. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

D. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

E. SSPC-SP 13 - Surface Preparation of Concrete; 1997 (Reaffirmed 2003).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches (216 by 279 mm) in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.
   2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens definitely not required.
   3. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as masonry, have been approved.

D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.

E. Manufacturer's Instructions: Indicate special surface preparation procedures.

F. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Paint and Finish Materials: 1 gallon (4 L) of each color, type, surface texture, and sheen; from the same product run, store where directed.
   3. Label each container with color in addition to the manufacturer's label.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five years experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.07 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply materials when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F (3 degrees C) above the dew point; or to damp or wet surfaces.

D. Minimum Application Temperatures for Paints: 50 degrees F (10 degrees C) for interiors unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.

B. Paints:
1. Benjamin Moore & Co: www.benjaminmoore.com.
2. Diamond Vogel Paints: www.diamondvogel.com/#sle.
3. PPG Paints: www.ppgpaints.com/#sle.
4. Pratt & Lambert Paints: www.prattandlambert.com.
5. Sherwin-Williams Company: www.sherwin-williams.com/#sle.

C. Primer Sealers: Same manufacturer as top coats.

D. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready mixed, unless intended to be a field-catalyzed paint.
1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
4. Supply each paint material in quantity required to complete entire project's work from a single production run.

5. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. Volatile Organic Compound (VOC) Content: Comply with Section 01 6116.

C. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.

D. Colors <PT-#>: As indicated in Color Schedule.
   1. Color Schedule: See drawings for product information.
   2. Allow for minimum of six colors for each system, unless otherwise indicated, without additional cost to Owner.
   3. Extend colors to surface edges; colors may change at any edge as directed by Architect.
   4. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under, unless noted otherwise.

2.03 PAINT SYSTEMS - INTERIOR

A. Paint I-OP - Interior Surfaces to be Painted, Unless Otherwise Indicated: Including gypsum board, concrete, concrete masonry units, brick, wood, plaster, uncoated steel, shop primed steel, galvanized steel, aluminum, and acoustical ceilings.
   1. Two top coats and one coat primer.
   2. Top Coat(s): Interior Latex.
      a. Basis of Design Products:
         1) Sherwin-Williams ProMar 200 Zero VOC Interior Latex, Semi-Gloss. (MPI #43)
         2) Sherwin-Williams ProMar 200 Zero VOC Interior Latex, Eg-Shel. (MPI #52)
   3. Primer: As recommended by top coat manufacturer for specific substrate.

B. Paint I-OP-MD-DT - Medium Duty Door/Trim: For surfaces subject to frequent contact by occupants, including metals and wood:
   1. Medium duty applications include doors, door frames, railings, handrails, guardrails, and balustrades, unless noted otherwise.
   2. Two top coats and one coat primer.
   3. Top Coat(s): High Performance Architectural Interior Latex.
      a. Basis of Design Products:
         1) Sherwin-Williams Pro Industrial Pre-Catalyzed Waterbased Epoxy, Eg-Shel. (MPI #139)
         2) Sherwin-Williams Pro Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss. (MPI #141)
   4. Primer: As recommended by top coat manufacturer for specific substrate.

C. Paint I-OP-DF - Dry Fall: Metals; exposed structure and overhead-mounted services in utilitarian spaces, including shop primed steel deck, structural steel, metal fabrications, galvanized ducts, galvanized conduit, and galvanized piping.
   1. Shop primer by others.
   2. One top coat.
   3. Top Coat: Latex Dry Fall; MPI #118, 155, or 226.
      a. Basis of Design Products:
         1) Sherwin-Williams Waterborne Acrylic Dryfall, Eg-Shel. (MPI #155, 226)
   4. Primer: As recommended by top coat manufacturer for specific substrate.

2.04 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of paints and finishes until substrates have been properly prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

E. Test shop-applied primer for compatibility with subsequent cover materials.

F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Gypsum Wallboard: 12 percent.
   2. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
   3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

F. Concrete:
   1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
   2. Prepare surface as recommended by top coat manufacturer and according to SSPC-SP 13.

G. Masonry:

1. Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.
2. Prepare surface as recommended by top coat manufacturer.

H. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.

I. Aluminum: Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.

J. Galvanized Surfaces:
1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.

K. Ferrous Metal:
1. Solvent clean according to SSPC-SP 1.
2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.
3. Remove rust, loose mill scale, and other foreign substances using using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

L. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

M. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance in thicknesses specified by manufacturer.

E. Sand wood and metal surfaces lightly between coats to achieve required finish.

F. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 10 1100 - VISUAL DISPLAY UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Markerboards

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Blocking and supports.

1.03 REFERENCE STANDARDS

A. ANSI A208.1 - American National Standard for Particleboard; 2009.

B. ASTM A424/A424M - Standard Specification for Steel, Sheet, for Porcelain Enameling; 2009a (Reapproved 2016).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's data on markerboard, tackboard, trim, and accessories.

C. Shop Drawings: Indicate wall elevations, dimensions, joint locations, special anchor details.

D. Samples: Submit two samples 2 by 2 inch (50 by 50 mm) in size illustrating materials and finish, color and texture of markerboard, tackboard, and trim.

E. Manufacturer's printed installation instructions.

F. Maintenance Data: Include data on regular cleaning, stain removal .

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide five year warranty for markerboard to include warranty against discoloration due to cleaning, crazing or cracking, and staining.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. ADP Lemco, Inc: www.adplemco.com/#sle.

B. Claridge Products and Equipment, Inc: www.claridgeproducts.com/#sle.

C. MooreCo, Inc: www.moorecoinc.com/#sle.

D. Nelson Adams NACO: www.nelsonadamsnaco.com/#sle.

E. Polyvision Corporation: www.polyvision.com/#sle.

F. Substitutions: See Section 01 6000 - Product Requirements.

2.02 VISUAL DISPLAY UNITS

A. Markerboards <MRKBD-1>: Porcelain enamel on steel, laminated to core.
   1. Color: As selected from manufacturer's full range.
   2. Steel Face Sheet Thickness: 24 gauge, 0.0239 inch (0.61 mm).
   3. Core: Particleboard, manufacturer's standard thickness, laminated to face sheet.
   4. Backing: Galvanized steel sheet, laminated to core.
   5. Size: As indicated on drawings.
   6. Frame: Extruded aluminum, with concealed fasteners.
   7. Frame Finish: Anodized, natural.
   8. Accessories: Provide marker tray and map rail.

2.03 MATERIALS

A. Porcelain Enameled Steel Sheet: ASTM A424/A424M, Type I, Commercial Steel, with fired-on vitreous finish.

B. Particleboard: ANSI A208.1; wood chips, set with waterproof resin binder, sanded faces.

C. Steel Sheet Backing: 28 gauge, 0.0149 inch (0.38 mm), galvanized.

D. Adhesives: Type used by manufacturer.

2.04 ACCESSORIES

A. Marker Tray: Aluminum, manufacturer's standard profile, one piece full length of markerboard, molded ends, concealed fasteners, same finish as frame.

B. Mounting Brackets: Concealed.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that internal wall blocking is ready to receive work and positioning dimensions are as indicated on shop drawings.

3.02 INSTALLATION

A. Install boards in accordance with manufacturer's instructions.

B. Secure units level and plumb.

3.03 CLEANING

A. Clean board surfaces in accordance with manufacturer's instructions.

B. Remove temporary protective cover at Date of Substantial Completion.

END OF SECTION

SECTION 10 1400 - SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Room and door signs.

B. Exterior building signs.

1.02 REFERENCE STANDARDS

A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.

B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

C. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.

C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
   1. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.
   2. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
   3. Submit for approval by Owner through Architect prior to fabrication.

D. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.

E. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.

F. Verification Samples: Submit samples showing colors specified.

G. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

H. Manufacturer's Qualification Statement.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Package signs as required to prevent damage before installation.

B. Package room and door signs in sequential order of installation, labeled by floor or building.

C. Store tape adhesive at normal room temperature.

1.06 FIELD CONDITIONS

A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.

B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Flat Signs:
   1. Best Sign Systems, Inc: www.bestsigns.com.
   2. Inpro: www.inprocorp.com/#sle.
   3. Mohawk Sign Systems, Inc: www.mohawksign.com.
   4. Seton Identification Products: www.seton.com/aec.
   5. Gemini: www.signletters.com.
   6. Takeform: www.takeform.net.
   7. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SIGNAGE APPLICATIONS

A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

B. Room and Door Signs: As indicated on drawings.
   1. Sign Type: Flat signs with applied character panel media as specified.
   2. Provide "tactile" signage, with letters raised minimum 1/32 inch (0.8 mm) and Grade II braille.
   3. Character Height: 1 inch (25 mm).
   4. Office Doors: Identify with room numbers to be determined later, not the numbers shown on the drawings.
   5. Classrooms and Assembly Rooms: Identify with room numbers and names to be determined later, not the numbers shown on the drawings.
      a. Provide "Maximum Occupant" signs at assembly rooms.
   6. Service Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings.
   7. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", room numbers to be determined later, and braille.

C. Building Identification Signs:
   1. Use individual metal letters.
   2. Mount on outside wall in location indicated on drawings.

2.03 SIGN TYPES

A. Flat Signs: Signage media without frame. See drawings for materials and configuration.
   1. Size: 8 inches square, unless noted otherwise on the drawings.
   2. Edges: Bevelled.

3. Corners: Square.
4. Wall Mounting of One-Sided Signs: Tape adhesive for interior signs and concealed screws for exterior signs.

B. Color and Font: Unless otherwise indicated:
1. Character Font: Helvetica.
2. Character Case: Upper case only.
3. Character and background Color: As selected by Architect.

2.04 TACTILE SIGNAGE MEDIA

A. Applied Character Panels: Acrylic plastic base, with applied acrylic plastic letters and braille.
1. Total Thickness: 1/8 inch (3 mm).
2. Letter Thickness: 1/8 inch (3 mm).
3. Letter Edges: Square.

2.05 DIMENSIONAL LETTERS

A. Metal Letters:
1. Font: CD Gothic
2. Height: 8 inches.
3. Finish: Satin Alumilite.
4. Mounting: Tape adhesive.

2.06 ACCESSORIES

A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.

B. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install neatly, with horizontal edges level.

C. Locate signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.

D. Protect from damage until Date of Substantial Completion; repair or replace damaged items.

END OF SECTION

SECTION 10 2113.19 - PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Solid plastic toilet compartments.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Blocking and supports.

B. Section 10 2800 - Toilet, Bath, and Laundry Accessories.

1.03 REFERENCE STANDARDS

A. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2015.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on panel construction, hardware, and accessories.

C. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.

D. Samples: Submit two samples of partition panels, 6 x 6 inch (152 x 152 mm) in size illustrating panel finish, color, and sheen.

E. Manufacturer's Installation Instructions: Indicate special procedures.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Solid Plastic Toilet Compartments:
   1. All American Metal Corp - AAMCO: www.allamericanmetal.com/#sle.
   2. Ampco Products, Inc: www.ampco.com/#sle.
   3. Accurate Partitions Corporation: www.accuratepartitions.com.
   4. Comtec Industries: www.comtecindustries.com.
   5. Global Partitions: www.globalpartitions.com.
   6. Metpar Corp: www.metpar.com/#sle.
   7. Sanymetal Products Company: www.sanymetal.com.
   8. Scranton Products: www.scrantonproducts.com/#sle.
   9. Substitutions: Section 01 6000 - Product Requirements.

2.02 PLASTIC TOILET COMPARTMENTS

A. Solid Plastic Toilet Compartments <COMP-1>: Factory fabricated doors, pilasters, and divider panels made of solid molded high density polyethylene (HDPE), tested in accordance with NFPA 286; floor-mounted headrail-braced.

1. Basis of Design: Scranton Products Hiny Hiders.
2. Color: Grey.
3. Texture: Orange Peel.

B. Doors:
1. Thickness: 1 inch (25 mm).
2. Width: 24 inch (610 mm).
3. Width for Handicapped Use: 36 inch (915 mm), out-swinging.
4. Height: 55 inch (1397 mm).

C. Panels:
1. Thickness: 1 inch (25 mm).
2. Height: 55 inch (1397 mm).
3. Depth: As indicated on drawings.

D. Pilasters:
1. Thickness: 1 inch (25 mm).
2. Width: As required to fit space; minimum 3 inch (76 mm).

2.03 ACCESSORIES

A. Pilaster Shoes: Stainless steel, satin finish, 3 inches (76 mm) high; concealing floor fastenings.
1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.

B. Head Rails: Extruded aluminum, anti-grip profile.
1. Size: Manufacturer's standard size.

C. Wall and Pilaster Brackets: Stainless steel; manufacturer's standard type for conditions indicated on drawings.

D. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.
1. For attaching panels and pilasters to brackets: Through-bolts and nuts; tamper proof.

E. Hinges: Stainless steel, manufacturer's standard finish.
1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.

F. Door Hardware: Stainless steel, manufacturer's standard finish.
1. Door Latch: Slide type with exterior emergency access feature.
2. Door Strike and Keeper with Rubber Bumper: Mount on pilaster in alignment with door latch.

G. Coat Hook with Rubber Bumper: One per compartment, mounted on door.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify correct spacing of and between plumbing fixtures.

C. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.

B. Maintain 3/8 inch to 1/2 inch (9 mm to 13 mm) space between wall and panels and between wall and end pilasters.

C. Attach panel brackets securely to walls using anchor devices.

D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.

3.03 TOLERANCES

A. Maximum Variation From True Position: 1/4 inch (6 mm).

B. Maximum Variation From Plumb: 1/8 inch (3 mm).

3.04 ADJUSTING

A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch (5 mm).

B. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.

C. Adjust adjacent components for consistency of line or plane.

END OF SECTION

SECTION 10 2600 - WALL AND DOOR PROTECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Corner guards.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Blocking for wall and corner guard anchors.

1.03 REFERENCE STANDARDS

A. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2010, with Editorial Revision (2015).

B. ASTM D543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents; 2014.

C. ASTM F476 - Standard Test Methods for Security of Swinging Door Assemblies; 2014.

D. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Indicate physical dimensions, features, wall mounting brackets with mounted measurements, anchorage details, and rough-in measurements.

C. Samples: Submit samples illustrating component design, configurations, joinery, color and finish.
   1. Submit two sections of corner guards, 6 inches (152 mm) long.

D. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project:
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Stock Materials: One package(s) of minimum 96 inches (2438 mm) long unit of each kind of covers for corner guards.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver wall and door protection items in original, undamaged protective packaging. Label items to designate installation locations.

B. Protect work from moisture damage.

C. Protect work from UV light damage.

D. Do not deliver products to project site until areas for storage and installation are fully enclosed, and interior temperature and humidity are in compliance with manufacturer's recommendations for each type of item.

E. Store products in either horizontal or vertical position, in compliance with manufacturer's instructions.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a one year period after Date of Substantial Completion.

C. Provide five year manufacturer and installer warranty for metal crash rails.
   1. Failures include, but are not limited to, the following:
      a. Structural failures, internal connection failures, and/or detachment of rail system from substrates.
      b. Deterioration of materials beyond that expected of normal use, as intended by manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Corner Guards:
   1. Construction Specialties, Inc: www.c-sgroup.com.
   2. Inpro: www.inprocorp.com.
   3. Koroseal Interior Products: www.koroseal.com.
   4. Nystrom, Inc: www.nystrom.com/sle.
   5. Trim-Tex, Inc: www.trim-tex.com/#sle.
   6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE CRITERIA

A. Impact Strength: Unless otherwise noted, provide protection products and assemblies that have been successfully tested for compliance with applicable provisions of ASTM D256 and/or ASTM F476.

B. Chemical and Stain Resistance: Unless otherwise noted, provide protection products and assemblies with chemical and stain resistance complying with applicable provisions of ASTM D543.

C. Fungal Resistance: Unless otherwise noted, provide protection products and assemblies which pass ASTM G21 testing.

2.03 PRODUCT TYPES

A. Corner Guards - Surface Mounted <CG-3>:
   1. Material: Type 304, 16 gauge stainless steel.
   2. Width of Wings: 2 inches (51 mm).
   3. Corner: Square.
   4. Color: As selected from manufacturer's standard colors.
   5. Length: One piece.

B. Adhesives and Primers: As recommended by manufacturer.

C. See Section 06 1000 for wood blocking for wall and corner guard anchors.

2.04 FABRICATION

A. Fabricate components with tight joints, corners and seams.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.

B. Verify that field measurements are as indicated on drawings.

C. Verify that substrate surfaces for adhered items are clean and smooth.

D. Start of installation constitutes acceptance of project conditions.

3.02 INSTALLATION

A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to supporting construction.

B. Position corner guard above wall base to ceiling.

3.03 TOLERANCES

A. Maximum Variation From Required Height: 1/4 inch (6 mm).

B. Maximum Variation From Level or Plane For Visible Length: 1/4 inch (6 mm).

3.04 CLEANING

A. Clean wall and door protection items of excess adhesive, dust, dirt, and other contaminants.

END OF SECTION

SECTION 10 2641 - BALLISTICS RESISTANT PANELS - WACO COMPOSITES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Laminated fiberglass ballistics-resistant panels.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood framing to receive ballistics-resistant panels.

B. Section 06 4100 - Architectural Wood Casework: Casework to receive ballistics-resistant panels.

C. Section 09 2116 - Gypsum Board Assemblies: Metal framing to receive ballistics-resistant panels.

1.03 REFERENCE STANDARDS

A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2016a.

B. NIJ 0108.01 - Standard for Ballistic Resistant Protective Materials; 1985.

C. UL 752 - Standard for Bullet-Resisting Equipment; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's current data sheets on each product to be used.

C. Shop Drawings: Details of installation of ballistics-resistant panels, including plan views, elevations, sections, and details of proposed installation with attachment methods.

1.05 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide ten year manufacturer warranty for materials and workmanship against defects commencing on the Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Laminated Fiberglass Ballistics-Resistant Panels:
   1. ArmorCore by Waco Composites; Bullet Resistant Fiberglass Panels: www.armorcore.com/#sle.
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 LAMINATED FIBERGLASS BALLISTICS-RESISTANT PANELS

A. General Requirements:
   1. Laminated fiberglass ballistics-resistant panels to be nonricochet type; designed to encapture and retain attacking projectile reducing potential of random injury or lateral penetration.
   2. Ballistics Resistance of Joints: Equal to that of panel.

3. Fabricate panels using multiple layers of woven roving ballistics grade fiberglass cloth impregnated with thermoset polyester resin and compressed into flat rigid sheets.
4. Panels to be listed and labeled by Underwriters Laboratories, Inc for specified UL 752 ballistics resistance rating; NIJ 0108.01 ballistics resistance rating, where applicable, to be verified by independent testing laboratory.
5. Fire Resistance Rating: One hour, when tested in accordance with ASTM E119.

B. Laminated Fiberglass Panel:
1. Ballistics Resistance Rating: UL 752 Level 8/NIJ 0108.01 Level III (7.62 mm assault rifle).
2. Panel Thickness: 1-7/16 inches (36.5 mm), nominal.
3. Panel Weight: 15.2 psf (74.2 kg per sq m), nominal.
4. Attachment Method: Mechanical fasteners.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Verify that substrates have been properly prepared.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation of this work.

3.03 INSTALLATION

A. Install panels in accordance with manufacturer's instructions and shop drawings and in proper relationship with adjacent construction.

END OF SECTION

SECTION 10 2800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Commercial toilet accessories.

B. Commercial shower and bath accessories.

C. Diaper changing stations.

D. Utility room accessories.

E. Locker Benches.

1.02 RELATED REQUIREMENTS

A. Section 10 2113.19 - Plastic Toilet Compartments.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2015a.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.

D. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

E. ASTM C1036 - Standard Specification for Flat Glass; 2016.

F. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2008 (Reapproved 2013).

G. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2004, with Editorial Revision (2016).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.

C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Commercial Toilet, Shower, and Bath Accessories:
   1. AJW Architectural Products: www.ajw.com.
   2. American Specialties, Inc: www.americanspecialties.com.
   3. Bradley Corporation: www.bradleycorp.com.
   4. Bobrick Washroom Equipment, Inc: www.bobrick.com.
   5. Substitutions: Section 01 6000 - Product Requirements.

B. Provide products of each category type by single manufacturer.

2.02 MATERIALS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
   1. Grind welded joints smooth.
   2. Fabricate units made of metal sheet of seamless sheets with flat surfaces.

B. Stainless Steel Sheet: ASTM A666, Type 304.

C. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.

D. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.

E. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.

F. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.

2.03 FINISHES

A. Stainless Steel: Satin finish, unless otherwise noted.

B. Back paint components where contact is made with building finishes to prevent electrolysis.

2.04 Commercial Toilet Accessories

A. Toilet Paper Dispenser <TP-1>: Stainless steel double roll toilet tissue dispenser.
   1. Basis of Design: Uline H-2546: www.uline.com.

B. Frameless Mirros <MIR-50>: Frameless, 6mm thick mirror.
   1. Size: As indicated on drawings.
   2. Installation: Secure mirror with metal mounting clips to wall with screws, then engage mirror into clips.
   3. Basis of Design: 747 Series manufactured by Bradley.

C. Grab Bars: Stainless steel, textured surface.
   1. Standard Duty Grab Bars:
      a. Push/Pull Point Load: 250 pound-force (1112 N), minimum.

b. Dimensions: 1-1/2 inch (38 mm) outside diameter, minimum 0.05 inch (1.3 mm) wall thickness, concealed flange mounting, 1-1/2 inch (38 mm) clearance between wall and inside of grab bar.
c. Finish: Satin.
d. Length and Configuration (see drawings for which of the following are used):
1) <GB-18>: 18 inches. Basis of Design 812 Series by Bradley.
2) <GB-36>: 36 inches. Basis of Design 812 Series by Bradley.
3) <GB-42>: 42 inches. Basis of Design 812 Series by Bradley.
4) <GB-L>: L-Shaped. Basis of Design 800 Series by Bradley.

D. Coat Hook <HK-1>: Stainless steel, 3 inch (75 mm) extension from wall; rectangular-shaped bracket and backplate for concealed attachment, satin finish.
1. Basis of Design: Model 9134 manufactured by Bradley.

2.05 Commercial Shower and Bath Accessories

A. Shower Curtain Rod <ROD-1>: Stainless steel tube, 1 inch (25 mm) outside diameter, 0.04 inch (1.0 mm) wall thickness, satin-finished, with 3 inch (75 mm) outside diameter, minimum 0.04 inch (1.0 mm) thick satin-finished stainless steel flanges, for installation with exposed fasteners.
1. Basis of Design: Model 9539 manufactured by Bradley.

B. Folding Shower Seat: <SST-1>: Wall-mounted surface; welded tubular seat frame, structural support members, swing-down legs, hinges, and mechanical fasteners of Type 304 stainless steel, L-shaped, right hand seat.
1. Basis of Design: Model 9569 manufactured by Bradley.
2. Seat: Phenolic or polymeric composite one-piece seat or seat slats, of color as selected.
3. Size: ADA Standards compliant.

C. Locker Benches <BENCH-10>: Stationary type; wood butcher block bench top; painted steel pedestals.

2.06 Diaper Changing Stations

A. Diaper Changing Station: Wall-mounted folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.
1. Basis of Design <BCS-1>: Model KB200 manufactured by Koala Care.
2. Material: Polyethylene.
3. Mounting: Surface.

2.07 Utility Room Accessories

A. Combination Utility Shelf/Mop and Broom Holder <MOP-1>: 0.05 inch (1.3 mm) thick stainless steel, Type 304, with 1/2 inch (12 mm) returned edges, 0.06 inch (1.6 mm) steel wall brackets.
1. Basis of Design: Model 9933 manufactured by Bradley.
2. Hooks: Two, 0.06 inch (1.6 mm) stainless steel rag hooks at shelf front.
3. Mop/broom holders: Three spring-loaded rubber cam holders at shelf front.
4. Length: Manufacturer's standard length for number of holders/hooks.
5. Provide one in each janitor's closet, locations indicated as <MOP HLDR-1>, unless otherwise noted.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify exact location of accessories for installation.

C. Verify that field measurements are as indicated on drawings.

D. See Section 06 1000 for installation of blocking, reinforcing plates, and concealed anchors in walls and ceilings.

3.02 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation.

B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.

B. Install plumb and level, securely and rigidly anchored to substrate.

C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.

3.04 PROTECTION

A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION

SECTION 10 4400 - FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire extinguishers.

B. Fire extinguisher cabinets.

C. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.

1.03 REFERENCE STANDARDS

A. FM (AG) - FM Approval Guide; current edition.

B. NFPA 10 - Standard for Portable Fire Extinguishers; 2017.

C. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide extinguisher operational features, extinguisher ratings and classifications, color and finish, and anchorage details.

C. Shop Drawings: Indicate locations of cabinets, cabinet physical dimensions, and rough-in measurements for recessed cabinets.

D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

1.05 FIELD CONDITIONS

A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fire Extinguishers:
   1. Activar Construction Products Group, Inc. - JL Industries: www.activarcpg.com/#sle.
   2. Ansul, a Tyco Business: www.ansul.com/#sle.
   3. Kidde, a unit of United Technologies Corp: www.kidde.com/#sle.
   4. Nystrom, Inc: www.nystrom.com/#sle.

5. Pyro-Chem, a Tyco Business: www.pyrochem.com/#sle.
6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FIRE EXTINGUISHERS

A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
   1. Provide extinguishers labeled by UL (DIR) or FM (AG) for purpose specified and as indicated.

B. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gauge.
   1. Provide one fire extinguisher for each cabinet or bracket indicated on the drawings.
   2. Basis of Design: Cosmic by JL Industries.
   3. Class: A:B:C type.
   4. Size: 10 pound (4.54 kg).
   5. Finish: Baked polyester powder coat, color as selected.
   6. Temperature range: Minus 40 degrees F (Minus 40 degrees C) to 120 degrees F (49 degrees C).

2.03 FIRE EXTINGUISHER CABINETS

A. Fire-Rated Construction: Provide fire-rated cabinets in fire-rated walls (see drawings for locations).

B. Cabinet Configuration <FCAB-1>: Semi-recessed type.
   1. Size to accommodate accessories.
   2. Basis of Design: JL Industries "Ambassador Series" sized for 10 lb fire extinguisher.
   3. Projected Trim: Returned to wall surface, with 2-1/2 inch (63 mm) projection, and 1-3/4 inch (44 mm) wide face.
   4. Provide cabinet enclosure with right angle inside corners and seams, and with formed perimeter trim and door stiles.

C. Door: 0.036 inch (0.9 mm) metal thickness, reinforced for flatness and rigidity with nylon catch. Hinge doors for 180 degree opening with two butt hinges.

D. Door Glazing: Float glass, clear, 1/8 inch (3 mm) thick, and set in resilient channel glazing gasket.

E. Cabinet Mounting Hardware: Appropriate to cabinet, with pre-drilled holes for placement of anchors.

F. Fabrication: Weld, fill, and grind components smooth.

G. Finish of Cabinet Exterior Trim and Door: Baked enamel, color as selected.

H. Finish of Cabinet Interior: White colored enamel.

2.04 ACCESSORIES

A. Cabinet Signage: Silk-screened vertical red lettering applied to the door - FIRE EXTINGUISHER.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Secure rigidly in place.

C. Place extinguishers in cabinets.

END OF SECTION

SECTION 10 5500 - POSTAL SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Payment drop boxes.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete pedestal and anchor bolts for mail box.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's specifications and descriptive literature, installation instructions and maintenance information.

1.04 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide manufacturer's warranty against defects in materials or workmanship for a period of 5 years from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 PAYMENT DROP BOXES

A. Manufacturers:
   1. Florence Manufacturing Company: www.florencemailboxes.com/#sle.
   2. Jensen Mailboxes: www.jensenmailboxes.com/#sle.
   3. Postal Products Unlimited, Inc: www.postalproducts.com/#sle.
   4. Salsbury Industries: www.mailboxes.com/#sle.
   5. Security Manufacturing Corp: www.securitymanufacturing.com/#sle.
   6. Covenant Security Equipment: www.covenantsecurityequipment.com.
   7. Substitutions: See Section 01 6000 - Product Requirements.

2.02 COMPONENTS

A. Outdoor Payment Drop Box: Stainless steel, pedestal-mounted, parcel receptacle with weather-resistant cabinet for outdoor installation:
   1. Basis of Design: Covenant Security Equipment CSE-AS-PD: www.covenantsecurityequipment.com.
   2. Capacity: 100+ payments.
   3. Accessibility: Drive up.
   4. Installation: In ground.
   5. Locking - Front Loading Master Door: Four keys.
   6. Snorkle deposit slot.
   7. Anti-fish teeth.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that concrete base and anchor bolts are ready to receive pedestal-mounted units.

B. Do not begin installation until unacceptable conditions are corrected.

END OF SECTION

SECTION 10 7500 - FLAGPOLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum Flagpoles.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete base and foundation construction.

1.03 REFERENCE STANDARDS

A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

B. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2013.

C. NAAMM FP 1001 - Guide Specifications for Design Loads of Metal Flagpoles; 2007.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on pole, accessories, and configurations.

C. Shop Drawings: Indicate detailed dimensions, base details, anchor requirements, and imposed loads.

D. Maintenance Data: Provide lubrication and periodic maintenance requirement schedules and instructions.

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Design flagpole foundation under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed the State in which the Project is located.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Spiral wrap flagpole with protective covering and pack in protective shipping tubes or containers.

B. Protect flagpole and accessories from damage or moisture.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Flagpoles:
   1. American Flagpole: www.americanflagpole.com/#sle.
   2. Concord Industries, Inc: www.concordindustries.com/#sle.
   3. Pole-Tech Co, Inc: www.poletech.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FLAGPOLES

A. Flagpoles: Designed in accordance with NAAMM FP 1001.
   1. Material: Aluminum.
   2. Design: Step tapered.
   3. Mounting: Ground mounted type.
   4. Nominal Height: 30 ft (9.14 m); measured from nominal ground elevation.
   5. Halyard: External type .

B. Performance Requirements:
   1. Wind Pressure Loading on Flagpole with Flag: Resistant without permanent deformation to 90 miles/hr (145 km/hr) wind speed, in accordance with NAAMM FP 1001; the factor of safety used is 2.5.

2.03 POLE MATERIALS

A. Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.

2.04 ACCESSORIES

A. Finial Ball: Stainless steel, 6 inch (150 mm) diameter.

B. Truck Assembly: Cast aluminum; revolving, stainless steel ball bearings, non-fouling.

C. Cleats: 9 inch (230 mm) size, aluminum with galvanized steel fastenings, two per halyard.

D. Halyard: 5/16 inch (8 mm) diameter polypropylene, braided, white.

2.05 MOUNTING COMPONENTS

A. Foundation Tube Sleeve: AASHTO M 36M, corrugated 16 gage (1.5 mm) steel, galvanized, depth as recommended by manufacturer.

B. Pole Base Attachment: Flush; steel base with base cover.

2.06 FINISHING

A. Metal Surfaces in Contact With Concrete: Asphaltic paint.

B. Aluminum: Mill finish.

C. Finial: Spun finish.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that concrete foundation is ready to receive work and dimensions are as indicated on shop drawings.

3.02 PREPARATION

A. Coat metal sleeve surfaces below grade and surfaces in contact with dissimilar materials with asphaltic paint.

3.03 INSTALLATION

A. Install flagpole, base assembly, and fittings in accordance with manufacturer's instructions.

B. Fill foundation tube sleeve with concrete specified in Section 03 3000.

C. Install foundation plate and centering wedges for flagpoles base set in concrete base and fasten.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1 inch (25 mm).

3.05 ADJUSTING

A. Adjust operating devices so that halyard and flag function smoothly.

END OF SECTION

SECTION 12 2400 - WINDOW SHADES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior manual roller shades.

B. Interior motorized roller shades.

C. Motor controls.

1.02 REFERENCE STANDARDS

A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

B. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

C. WCMA A100.1 - Safety of Window Covering Products; 2018.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week prior to commencing work related to products of this section; require attendance of affected installers.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets, including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.

C. Shop Drawings: Include shade schedule indicating size, location and keys to details, head, jamb and sill details, mounting dimension requirements for each product and condition, and operation direction.

D. Verification Samples: Minimum size 6 inches (150 mm) square, representing actual materials, color and pattern.

E. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation, and installation of product.

F. Operation and Maintenance Data: List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of shop drawings.

G. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.

B. Handle and store shades in accordance with manufacturer's recommendations.

1.06 FIELD CONDITIONS

A. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide manufacturer's warranty from Date of Substantial Completion, covering the following:
   1. Shade Hardware: One year.
   2. Fabric: One year.
   3. Aluminum and Steel Coatings: One year.

PART 2 PRODUCTS

2.01 Manufacturers

A. Interior Manually Operated Roller Shades:
   1. Comfortex: www.comfortex.com.
   2. Draper, Inc: www.draperinc.com/#sle.
   3. Hunter Douglas Architectural: www.hunterdouglasarchitectural.com/#sle.
   4. Levolor: www.levolor.com/commercial/#sle.
   5. MechoShade Systems LLC: www.mechoshade.com/#sle.
   6. SWFcontract, a division of Springs Window Fashions, LLC.: www.swfcontract.com/#sle.
   7. Substitutions: See Section 01 6000 - Product Requirements.

B. Interior Motorized Roller Shades, Motors and Motor Controls:
   1. Comfortex: www.comfortex.com.
   2. Draper, Inc: www.draperinc.com/#sle.
   3. Hunter Douglas Architectural: www.hunterdouglasarchitectural.com/#sle.
   4. Levolor: www.levolor.com/commercial/#sle.
   5. MechoShade Systems LLC: www.mechoshade.com/#sle.
   6. SWFcontract, a division of Springs Window Fashions, LLC: www.swfcontract.com/#sle.
   7. Substitutions: See Section 01 6000 - Product Requirements.

2.02 Roller Shades

A. General:
   1. Provide shade system components that are easy to remove or adjust without removal of mounted shade brackets.
   2. Provide shade system that operates smoothly when shades are raised or lowered.
   3. Motorized Shades: Motor system housed inside roller tube, controlling shade movement via motor controls indicated; listed or recognized to UL 325.
      a. Comply with NFPA 70.
      b. Electrical Components: Listed, classified, and labeled as suitable for the purpose intended. Where applicable, system components to be FCC compliant.
      c. Motors: Size and configuration as recommended by manufacturer for the type, size, and arrangement of shades to be operated; integrated into shade operating components and concealed from view; fully compatible with controls to be installed.

B. Roller Shades <SHADES-1> - Basis of Design: MechoShade Systems LLC; Mecho/5 System; www.mechoshade.com/#sle.

1. Description: Single roller, manually operated fabric window shades.
    a. Drop Position: Regular roll.
    b. Mounting: Window jamb mounted.
    c. Size: As indicated on drawings.
    d. Fabric: As indicated under Shade Fabric article.
2. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
    a. Material: Steel, 1/8 inch (3 mm) thick.
3. Roller Tubes:
    a. Material: Extruded aluminum.
    b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
    c. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge. Shade band to be removable and replaceable without removing roller tube from brackets or inserting spline from the side of the roller tube.
    d. Roller tubes to be capable of being removed and reinstalled without affecting roller shade limit adjustments.
4. Hembars: Designed to maintain bottom of shade straight and flat.
    a. Style: Full wrap fabric covered bottom bar, flat profile with heat sealed closed ends.
    b. Room-Darkening Shades: Provide a slot in bottom bar with wool-pile light seal.
5. Clutch Operator: Manufacturer's standard material and design integrated with bracket/brake assembly.
    a. Provide a permanently lubricated brake assembly mounted on an oil-impregnated hub with wrapped spring clutch.
    b. Brake must withstand minimum pull force of 50 pounds (22.7 kg) in the stopped position.
    c. Mount clutch/brake assembly on the support brackets, fully independent of the roller tube components.
6. Drive Chain: Continuous loop stainless steel beaded ball chain, 95 pound (43 kg) minimum breaking strength. Provide upper and lower limit stops.
    a. Chain Retainer: Chain tensioning device complying with WCMA A100.1.
7. Accessories:
    a. Fascia: Extruded aluminum, size as required to conceal shade mounting, attachable to brackets without exposed fasteners; fabric wrapped finish to match shade.

C. Roller Shades <SHADES-2> - Basis of Design: MechoShade Systems LLC; ElectroShade with WhisperShade IQ2-DC EDU, low voltage (24 VDC); www.mechoshade.com/#sle.
1. Description: Single roller, motor-operated fabric window shade system complete with mounting brackets, roller tubes, hembars, hardware, and accessories.
    a. Mounting: Window jamb mounted.
    b. Size: As indicated on drawings.
    c. Fabric: As indicated under Shade Fabric article.
2. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
    a. Material: Steel, 1/8 inch (3 mm) thick.
3. Roller Tubes:
    a. Material: Extruded aluminum.
    b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
    c. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge. Shade band to be removable and replaceable without removing roller tube from brackets or inserting spline from the side of the roller tube.
4. Hembars: Designed to maintain bottom of shade straight and flat.

a. Style: Full wrap fabric covered bottom bar, flat profile with heat sealed closed ends.
b. Room-Darkening Shades: Provide a slot in bottom bar with wool-pile light seal.

5. Intelligent Encoded Electronic Drive System:
   a. Low Voltage EDU (24 VDC):
      1) Audible Noise: 38 dBA or less measured 3 feet from the motor unit, depending on motor torque.
      2) EDU to be capable of being configured to place the motor into Override Mode when local switch commands shade to new position. Upon entering Override Mode, EDU to monitor and log positioning commands from automation devices but not act upon them until exiting Override Mode.
      3) Preventative Maintenance: EDU to internally monitor important operating parameters to ensure motor and its shade assembly are functioning properly.
   b. Modes of Operation:
      1) Uniform Mode: Allows for shades to move only to defined intermediate stop positions in order to maintain aesthetic uniformity.
      2) Normal Mode: Allows for shades to move to defined intermediate stop positions plus any position between defined upper and lower limits.
      3) Maintenance Mode: Prevents shade from moving to newly commanded positions via dry contact or network control commands until EDU has been serviced and/or Maintenance Mode has been cleared/disabled.
   c. Control Methods: Support both local isolated dry contact input and network control.
      1) Local isolated dry contact inputs support local switch control and third-party system integration without separate interface.
      2) Bidirectional network communication enables commanding the operation of large groups of shades over a common backbone.
      3) Provide a minimum of three customizable preset positions accessible over the local dry contact control inputs and over the network connection.
      4) Provide a minimum of 32 customizable preset positions (including the three local switch presets) accessible via network commands.
6. Accessories:
   a. Fascia: Removable extruded aluminum fascia, size as required to conceal shade mounting, attachable to brackets without exposed fasteners; fabric wrapped finish to match shade.

2.03 Shade FABRIC

A. Fabric: Nonflammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation.
   1. Basis of Design:
      a. MechoShade Systems LLC; ThermoVeil - 1000 Series (2-3% open): www.mechoshade.com/#sle.
      b. Substitutions: See Section 01 6000 - Product Requirements.
   2. Color: To be selected by Architect.

2.04 MOTOR CONTROLS

A. Unless specifically indicated to be excluded, provide all required equipment, conduit, boxes, wiring, connectors, hardware, supports, accessories, software, system programming, etc. as necessary for a complete operating system that provides the control intent indicated.

B. Provide all components and connections necessary to interface with other systems as indicated.

C. Manual Controls:
   1. Control Functions:

a. Open: Automatically open controlled shade(s) to fully open position when button is pressed.
b. Close: Automatically close controlled shade(s) to fully closed position when button is pressed.
c. Multiple Shade Groups: Provide individual controls for each shade group as indicated.

2. Wall Controls: Provided by shade manufacturer.
a. Finish: To be selected by Architect.
b. Button Engraving: Manufacturer's standard engraving, unless otherwise indicated.

2.05 Roller Shade FABRICATION

A. Field measure finished openings prior to ordering or fabrication.

B. Dimensional Tolerances: Fabricate shades to fit openings within specified tolerances.
1. Vertical Dimensions: Fill openings from head to sill with 1/2 inch (13 mm) space between bottom bar and window stool.
2. Horizontal Dimensions - Inside Mounting: Fill openings from jamb to jamb.

C. At openings requiring continuous multiple shade units with separate rollers, locate roller joints at window mullion centers; butt rollers end-to-end.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine finished openings for deficiencies that may preclude satisfactory installation.

B. Start of installation shall be considered acceptance of substrates.

3.02 PREPARATION

A. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.

B. Coordinate with window installation and placement of concealed blocking to support shades.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.

B. Adjust level, projection, and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

3.04 SYSTEM STARTUP

A. Motorized Shade System: Provide services of a manufacturer's authorized representative to perform system startup.

3.05 CLEANING

A. Clean soiled shades and exposed components as recommended by manufacturer.

B. Replace shades that cannot be cleaned to "like new" condition.

3.06 CLOSEOUT ACTIVITIES

A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

B. Demonstration: Demonstrate operation and maintenance of window shade system to Owner's personnel.

C. Training: Train Owner's personnel on operation and maintenance of system.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
   2. Provide minimum of two hours training by manufacturer's authorized personnel at location designated by the Owner.

3.07 PROTECTION

A. Protect installed products from subsequent construction operations.

B. Touch-up, repair, or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 12 3600 - COUNTERTOPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Countertops for architectural cabinet work.

1.02 RELATED REQUIREMENTS

A. Section 06 4100 - Architectural Wood Casework.

B. Division 22 - Plumbing fixtures, sinks.

1.03 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014, with Errata (2016).

C. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.1; 2016, with Errata (2017).

D. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.

E. ISFA 3-01 - Classification and Standards for Quartz Surfacing Material; 2013.

F. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

G. NSI (DSDM) - Dimensional Stone Design Manual, Version VIII; 2016.

H. PS 1 - Structural Plywood; 2009.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Specimen warranty.

C. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.

D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.

E. Installation Instructions: Manufacturer's installation instructions and recommendations.

F. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.06 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 COUNTERTOPS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Plastic Laminate Countertops <PLAM CTOP-#>: High-pressure decorative laminate (HPDL) sheet bonded to substrate.
   1. Laminate Sheet: NEMA LD 3, Grade HGS, 0.048 inch (1.2 mm) nominal thickness.
      a. Basis of Design: See drawings for product information.
      b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
      c. Finish: Matte or suede, gloss rating of 5 to 20.
      d. Surface Color and Pattern: As selected by Architect from the manufacturer's full standard or premium line.
   2. Exposed Edge Treatment: Molded rubber edge sized to completely cover edge of panel.
      a. Color: As indicated on drawings.
   3. Back and End Splashes: Same material, same construction.
      a. Provide where indicated on the Drawings.
   4. Fabricate in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 11 - Countertops, Custom Grade.

C. Solid Surfacing Countertops <SSM-1>: Solid surfacing sheet or plastic resin casting over continuous substrate.
   1. Basis of Design: See drawings for product information.
   2. Flat Sheet Thickness: 1/2 inch (12 mm), minimum.
   3. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
      a. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
      b. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
   4. Other Components Thickness <SSM-X>: 1/2 inch (12 mm), minimum.
   5. Back and End Splashes: Same sheet material, square top; minimum 4 inches (102 mm) high.

D. Natural Quartz and Resin Composite Countertops: Sheet or slab of natural quartz and plastic resin over continuous substrate.

1. Basis of Design: See drawings for product information.
2. Flat Sheet Thickness: 1-1/4 inch (32 mm), minimum.
3. Natural Quartz and Resin Composite Sheets, Slabs and Castings: Complying with ISFA 3-01 and NEMA LD 3; orthophthalic polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard stone fabrication tools; no surface coating; color and pattern consistent throughout thickness.
    a. Factory fabricate components to the greatest extent practical in sizes and shapes indicated; comply with NSI (DSDM).
    b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
    c. NSF approved for food contact.
    d. Finish on Exposed Surfaces: Polished.
    e. Color and Pattern: As indicated.
4. Other Components Thickness: 3/4 inch (19 mm), minimum.
5. Exposed Edge Treatment: Built up to minimum 1-1/4 inch (32 mm) thick; square edge; use marine edge at sinks.
6. Back and End Splashes: Same sheet material, square top; minimum 4 inches (102 mm) high.

2.02 MATERIALS

A. Wood-Based Components:
    1. Wood fabricated from old growth timber is not permitted.
    2. Provide sustainably harvested wood, certified or labeled as specified in Section 01 6000 - Product Requirements.

B. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch (19 mm) thick; join lengths using metal splines.

C. Countertop Support Members: Furniture grade, epoxy powder coated steel.
    1. Basis of Design: Rakks Model EH-1818FM with cover bracket as manufactured by Rangine Corporation or approved equal.

D. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

2.03 FABRICATION

A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
    1. Join lengths of tops using best method recommended by manufacturer.
    2. Fabricate to overhang fronts and ends of cabinets 1 inch (25 mm) except where top butts against cabinet or wall.
    3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
    1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
    2. Height: 4 inches (102 mm), unless otherwise indicated.
    3. Detail top of backsplash to allow scribing of backsplash to wall.

C. Solid Surfacing: Fabricate tops and wall panels up to 144 inches (3657 mm) long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.
    1. Integral sinks <SSM-2>: Shop-mount securely to countertop with adhesives, using flush configuration, as per manufacturer's instructions, and as detailed on drawings.

a. Basis of Design: Hanex: www.hanexsolidsurface.co.uk.
b. Color: See drawings for product information.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.

B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch (16 mm).

C. Attach countertops using compatible adhesive as well as mechanical fasteners.

D. Seal joint between back/end splashes and vertical surfaces.

3.04 TOLERANCES

A. Variation From Horizontal: 1/8 inch in 10 feet (3 mm in 3 m), maximum.

B. Offset From Wall, Countertops: 1/8 inch (3 mm) maximum; 1/16 inch (1.5 mm) minimum.

C. Field Joints: 1/8 inch (3 mm) wide, maximum.

3.05 CLEANING

A. Clean countertops surfaces thoroughly.

3.06 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 14 2100 - ELECTRIC TRACTION ELEVATORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Complete electric traction elevator systems.
   1. Passenger type.

B. Elevator Maintenance Contract.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Includes elevator pit.

B. Section 04 2000 - Unit Masonry: Masonry hoistway enclosure; building-in and grouting hoistway door frames.

C. Section 203 - 203: Includes elevator pit ladder, sill supports, and overhead hoist beams.

D. Section 07 8400 - Firestopping: Fire rated sealant in hoistway.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. AISC 360 - Specification for Structural Steel Buildings; 2016.

C. ASME A17.1 - Safety Code for Elevators and Escalators; 2016.

D. ASME A17.2 - Guide for Inspection of Elevators, Escalators, and Moving Walks; 2014.

E. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2017.

F. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

G. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).

H. ITS (DIR) - Directory of Listed Products; current edition.

I. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

J. NEMA MG 1 - Motors and Generators; 2017.

K. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

L. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.

M. PS 1 - Structural Plywood; 2009.

N. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene meeting at least one week prior to start of this work.
   1. Review schedule of installation, proper procedures and conditions, and coordination with related work.

B. Construction Use of Elevator: Not permitted.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit data on following items:
   1. Signal and operating fixtures, operating panels, and indicators.
   2. Car design, dimensions, layout, and components.
   3. Car and hoistway door and frame details.
   4. Electrical characteristics and connection requirements.

C. Shop Drawings: Include appropriate plans, elevations, sections, diagrams, and details on following items:
   1. Elevator Equipment and Machines: Size and location of driving machines, power units, controllers, governors, and other components.
   2. Hoistway Components: Size and location of car machine beams, guide rails, buffers, ropes, and other components.
   3. Rail bracket spacing; maximum loads imposed on guide rails requiring load transfer to building structural framing.
   4. Individual weight of principal components; load reaction at points of support.
   5. Loads on hoisting beams.
   6. Clearances and over-travel of car and counterweight.
   7. Locations in hoistway of traveling cables and connections for car lighting and telephone.
   8. Location and sizes of hoistway and car doors and frames.
   9. Calculated heat dissipation of elevator equipment in machine room.
   10. Interface with building security system.
   11. Electrical characteristics and connection requirements.
   12. Indicate arrangement of elevator equipment and allow for clear passage of equipment through access openings.

D. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

E. Initial Maintenance Contract.

F. Maintenance Contract: Submit proposal to Owner for standard one year continuing maintenance contract agreement in accordance with ASME A17.1 and requirements as indicated, starting on date initial maintenance contract is scheduled to expire.
   1. Indicate in proposal the services, obligations, conditions, and terms for agreement period and for renewal options.

G. Operation and Maintenance Data:
   1. Parts catalog with complete list of equipment replacement parts; identify each entry with equipment description and identifying code.
   2. Operation and maintenance manual.

3. Schematic drawings of equipment, and wiring diagrams of installed electrical equipment with list of corresponding symbols to identify markings on hoistway apparatus.

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Design guide rails under direct supervision of a licensed Professional Structural Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum ten years documented experience.

C. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

D. Products Requiring Fire Resistance Rating: Listed and classified by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.

E. Products Requiring Electrical Connection: Listed and classified by UL (DIR) or testing agency acceptable to authorities having jurisdiction as suitable for the purpose indicated in construction documents.

F. Permits, Inspections and Certificates: The Elevator Contractor shall obtain and pay for necessary Municipal or State Inspection and permit as required by the elevator inspection authority, and make such tests as are called for by the regulations or such authorities. These tests shall be made in the presence of such authorities or their authorized representatives.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide manufacturer's warranty for elevator operating equipment and devices for one year from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design - Electric Traction Elevators: Gen2 Underslung Machine-Room Less by Otis Elevator Company; www.otis.com.

B. Other Acceptable Manufacturers - Electric Traction Elevators:
   1. Schindler Elevator Corporation: www.us.schindler.com/#sle.
   2. ThyssenKrupp Elevator: www.thyssenkruppelevator.com.

C. Substitutions: See Section 01 6000 - Product Requirements.

D. Products other than Basis of Design are subject to compliance with specified requirements and prior approval of Architect. By using products other than Basis of Design, the Contractor accepts responsibility for costs associated with any necessary modifications to related work, including any design fees.

E. Source Limitations: Provide elevator and associated equipment and components produced by the same manufacturer as the other elevator equipment used for this project and obtained from a single supplier.

2.02 ELECTRIC TRACTION ELEVATORS

A. Electric Traction Elevator:
   1. Electrical Power: 480 or 460 volts; alternating current (AC); three phase; 60 Hz.
   2. Rated Net Capacity: 3500 pounds (1590 kgs).
   3. Rated Speed: 150 to 350 feet per minute (0.75 to 1.78 m per second).
   4. Hoistway Size: As indicated on drawings.
   5. Interior Car Platform Size: As indicated on drawings.

2.03 COMPONENTS

A. Elevator Equipment:
   1. Motors, Controllers, Controls, Buttons, Wiring, Devices, and Indicators: Comply with NFPA 70 requirements, and refer to Section 26 0583 for additional requirements.
   2. Guide Rails, Cables, Counterweights, Sheaves, Buffers, Attachment Brackets and Anchors: Design criteria for components includes safety factors in accordance with applicable requirements of Elevator Code, ASME A17.1.
   3. Buffers:
      a. Spring type for elevators with speed less than or equal to 200 feet per minute (1 m per second).
   4. Lubrication Equipment:
      a. Provide grease fittings for periodic lubrication of bearings.
      b. Grease Cups: Automatic feed type.
      c. Lubrication Points: Visible and easily accessible.

B. Electrical Equipment:
   1. Motors: NEMA MG 1.
   2. Boxes, Conduit, Wiring, and Devices: Complying with NFPA 70 and in accordance with Division 26.
   3. Spare Conductors: Provide ten percent in extra conductors and two pairs of shielded audio cables in traveling cables.
   4. Include wiring and connections to elevator devices remote from hoistway.

2.04 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with ASME A17.1, applicable local codes, and authorities having jurisdiction (AHJ).

B. Accessibility Requirements: Comply with ADA Standards.

C. Perform structural steel design, fabrication, and installation in accordance with AISC 360.

D. Perform welding of steel in accordance with AWS D1.1/D1.1M.

E. Fabricate and install door and frame assemblies in accordance with NFPA 80 and complying with requirements of authorities having jurisdiction (AHJ).

F. Perform electrical work in accordance with NFPA 70.

2.05 OPERATION CONTROLS

A. Elevator Controls: Provide landing operating panels and landing indicator panels.

1. Landing Operating Panels: Metallic type, one for originating "Up" and one for originating "Down" calls, one button only at terminating landings; with illuminating indicators.
2. Landing Indicator Panels: Illuminating.
3. Comply with ADA Standards for elevator controls.

B. Interconnect elevator control system with building security, fire alarm, card access, and building management control systems.

C. Door Operation Controls:
1. Program door control to open doors automatically when car arrives at floor landing.
2. Elevator doors shall be provided with a reopening device that will stop and reopen the car door(s) and hoistway door(s) automatically should the door(s) become obstructed by an object or person.
3. Door protection shall consist of a two dimensional, multi-beam array projecting across the car door opening.
4. Door nudging operation to occur if doors are prevented from closing for an adjustable period of time.

D. Lobby Monitoring Panel:
1. Locate status indicator and control panel for each individual elevator and group of elevators as indicated on drawings.
2. Etch face plate markings in panel, and fill with paint of contrasting color.
3. Include direction indicator displaying landing "Up" and "Down" calls registered at each landing floor.
4. Include position and motion display for direction of travel of each elevator; display appropriate graphic characters on non-glare screen; indicate position of cars at rest and in motion.
5. Include a "Remove From In Service" switch for each elevator that then calls car to ground floor and parks car with doors open.
6. Include "Firefighter's Service Switch" that manually recalls each elevator to main floor.

E. Provide "Firefighter's Emergency Operation" in accordance with ASME A17.1, applicable building codes, and authorities having jurisdiction (AHJ).
1. Designated Landing: At Second floor.

2.06 OPERATION CONTROL TYPE

A. Single Automatic (Push Button) Operation Control (Freight Elevator): Applies to car in single elevator shaft.
1. Refer to description provided in ASME A17.1.
2. Set system operation so that momentary pressure of landing button dispatches car from other landing to that landing.
3. Allow call registered by momentary pressure of landing button at any time to remain registered until car stops in response to that landing call.
4. If elevator car door is not opened within predetermined period of time after car has stopped at terminal landing allow car to respond to call registered from other landing.

B. Provide system capabilities to enable a remote expert to create a live, interactive connection with the elevator system to enable the following functions:
1. Remotely diagnose elevator issues with a remote team of experts
2. Remotely return an elevator to service
3. Provide real-time status updates via email
4. Remotely make changes to selected elevator functions including:
a. Control building traffic: Restrict floor access, remove car from group operation, shut down elevator, select up peak/down peak mode, activate independent service

b. Conserve energy: Activate cab light energy save mode, activate fan energy save mode, shut down car(s)
c. Improve passenger experience: Extend door open times, change parking floor, activate auto car full, activate anti-nuisance, advance door opening, door nudging, extend specific floor extended opening time, release trapped passengers

2.07 MATERIALS

A. Stainless Steel Sheet: ASTM A666, Type 304; No. 4 Brushed finish unless otherwise indicated.

B. Stainless Steel Bars, Shapes and Moldings: ASTM A276/A276M, Type 304.

C. Plywood: PS 1, Structural I, Grade C-D or better, sanded.

D. Tile Flooring: As specified in Section 09 3000.

E. Plastic Laminate: NEMA LD 3, Type HGS, color as selected by Architect from manufacturer's standard line of colors.

2.08 CAR AND HOISTWAY ENTRANCES

A. Elevator:
1. Car and Hoistway Entrances:
a. Framed Opening Finish and Material: Alkyd enamel on steel.
b. Car Door Material: Powder coat on steel, with rigid sandwich panel construction.
c. Hoistway Door Material: Powder coat on steel, with rigid sandwich panel construction.

2.09 CAR EQUIPMENT AND MATERIALS

A. Elevator Car:
1. Car Operating Panel: Provide main and auxiliary; flush-mounted applied face plate, with illuminated call buttons corresponding to floors served with "Door Open/Door Close" buttons, "Door Open" button, "Door Close" button, and alarm button.
a. Panel Material: Integral with front return; one per car.
b. Car Floor Position Indicator: Above door with illuminating position indicators.
c. Locate alarm button where it is unlikely to be accidentally actuated; not more than 54 inch (1372 mm) above car finished floor.
2. Flooring: Ceramic Tile.
3. Front Return Panel: Match material of car door.
4. Door Wall: Stainless steel.
5. Side Walls: Plastic laminate on plywood.
6. Rear Wall: Plastic laminate on plywood.
7. Hand Rail: Stainless steel, at three side walls. Provide open clearance space 1-1/2 inch (38 mm) wide to face of wall.
a. Stainless Steel Finish: No. 4 Brushed.
8. Ceiling:
a. Canopy Ceiling: Plastic laminate on plywood.
b. Lighting: LED can lights.

B. Car Accessories:
1. Protective Pads: Canvas cover, padded with impact-resistant fill material, sewn with piping edges; fire resistant in compliance with ASME A17.1; brass grommets for supports, covering side and rear walls and front return, with cut-out for control panel; provide one set for each elevator.

a. Color: As selected by Architect.
b. Provide at least 4 inch (102 mm) clearance from bottom of pad to finished floor.
c. Pad Supports: Stainless steel studs, and mounted per manufacturer's standard.

2.10 FINISHES

A. Powder Coat on Steel: Clean and degrease metal surface; apply one coat of primer; two coats of powder coat.

B. Finish Paint for Metal Surfaces: Alkyd enamel, semi-gloss, color as selected, comply with VOC limitations of authorities having jurisdiction (AHJ).

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting this work.

B. Verify that hoistway and pit are ready for work of this section.

C. Verify hoistway shaft and openings are of correct size and within tolerance.

D. Verify location and size of machine foundation and position of machine foundation bolts.

E. Verify that electrical power is available and of correct characteristics.

3.02 PREPARATION

A. Maintain elevator pit excavation free of water.

3.03 INSTALLATION

A. Coordinate this work with installation of hoistway wall construction.

B. Install system components, and connect equipment to building utilities.

C. Provide conduit, electrical boxes, wiring, and accessories. Refer to Sections 26 0533.13 and 26 0583.

D. Mount machines and motors on vibration and acoustic isolators.
1. Prevent lateral displacement.

E. Install hoistway, elevator equipment, and components in accordance with approved shop drawings.

F. Install guide rails to allow for expansion and contraction movement of guide rails.

G. Accurately machine and align guide rails, forming smooth joints with machined splice plates.

H. Field Welds: Chip and clean away oxidation and residue with wire brush; spot prime with two coats.

I. Install hoistway door sills, frames, and headers in hoistway walls; grout sills in place, set hoistway floor entrances in alignment with car openings, and align plumb with hoistway.

J. Structural Metal Surfaces: Clean surfaces of rust, oil or grease; wipe clean with solvent; prime with two coats.

K. Wood Surfaces not Exposed to Public View: Finish with one coat primer; one coat enamel.

L. Adjust equipment for smooth and quiet operation.

3.04 TOLERANCES

A. Guide Rail Alignment: Plumb and parallel to each other in accordance with ASME A17.1 and ASME A17.2.

B. Car Movement on Aligned Guide Rails: Smooth movement, without any objectionable lateral or oscillating movement or vibration.

3.05 ADJUSTING

A. Adjust for smooth acceleration and deceleration of car to minimize passenger discomfort.

B. Adjust with automatic floor leveling feature at each floor landing to reach 1/4 inch (6.4 mm) maximum from flush with sill.

3.06 CLEANING

A. Remove protective coverings from finished surfaces.

B. Clean surfaces and components in accordance with manufacturers written instructions.

3.07 CLOSEOUT ACTIVITIES

A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

B. Demonstrate proper operation of equipment to Owner's designated representative.

C. Demonstration: Demonstrate operation of system to Owner's personnel.
   1. Use operation and maintenance data as reference during demonstration.
   2. Briefly describe function, operation, cleaning and maintenance of each component.

D. Training: Train Owner's personnel on cleaning and operation and maintenance of system.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
   2. Provide minimum of two hours of training.
   3. Instructor: Manufacturer's training personnel.
   4. Location: At project site, unless otherwise indicated.

3.08 PROTECTION

A. Do not permit construction traffic within car after cleaning.

B. Protect installed products until Date of Substantial Completion.

C. Touch-up, repair, or replace damaged products and materials before Date of Substantial Completion.

3.09 MAINTENANCE

A. Refer to Section 01 7000 - Execution and Closeout Requirements, for additional requirements relating to initial maintenance service.

B. Perform maintenance contract services using competent and qualified personnel under the supervision and direct employ of the elevator manufacturer or installer.

C. Maintenance contract services shall not be assigned or transferred to any agent or other entity without prior written consent of Owner.

D. Examine system components periodically.

E. Include systematic examination, adjustment, and lubrication of elevator equipment.

F. Perform work without removing cars from use during peak traffic periods.

G. Provide emergency call back service during regular working hours throughout period of this maintenance contract.

END OF SECTION

SECTION 210500 – FIRE PROTECTION GENERAL

PART 1 - GENERAL

1.1 SUMMARY

A. Specification Format

1. These Specifications are written in imperative and abbreviated form. This imperative language of the technical sections is directed at the Contractors, unless specifically noted otherwise. Incomplete sentences shall be completed by inserting "shall", "the Contractor shall", and "shall be", and similar mandatory phrases by inference in the same manner as they are applied to notes on the Drawings. The words "shall be" shall be supplied by inference where a colon (:) is used within sentences or phrases. Except as worded to the contrary, perform all indicated requirements whether stated imperatively or otherwise.
2. Three Part Format
    a. "Part 1 - General": Covers those areas which relate to the Work, and which define the general administrative and technical requirements specific to a particular section.
    b. "Part 2 - Products": Defines, in detail, the acceptance equipment and materials to be incorporated into the Work.
    c. "Part 3 - Execution": Describes, in detail, the manner in which items covered by Part 2 are to be incorporated into the Work.
3. Where Codes, Specifications and Drawings are in conflict, the Contractor will be deemed to have bid the more expensive method. Refer all such discrepancies immediately to the Engineer prior to commencing related work.

B. Definitions

1. Furnish: Supply equipment as required by these Drawings and Specifications, delivered to the job site for installation or use by others.
2. Install: Fix in position for total operational use all apparatus as shown, specified or required. Provide all miscellaneous fittings and wiring supplies.
3. Or Approved Equal: Equipment or materials selected by Contractor subject to Engineer's acceptance.
4. Or Equivalent: Equipment or materials selected by Contractor matching the function and performance of equipment or materials listed.
5. Provide: Furnish and install in place, total and operational.
6. Complete/Completely: All pipes, fittings, ducts, wiring supplies, and accessories provided for the noted equipment from the equipment to the mains or noted termination points.

1.2 NOMENCLATURE

A. NICET: National Institute for Certification in Engineering Technologies.

B. Pipe sizes listed are nominal pipe sizes throughout this Division except where otherwise noted.

1.3 SCOPE OF WORK

A. The work covered by this Division consists in furnishing all labor, equipment, accessories and materials and in performing all operations necessary for the installation of the fire protection systems, in strict accordance with Division 21 of this Specification and applicable Drawings and subject to the terms and conditions of the Contract.

B. Work of this Division is subject to requirements of Instructions to Bidders, General Conditions, Supplementary Conditions, Division One, and all other sections of this Specification.

C. Examine site and all Contract documents prior to submittal of bid.

1. Submittal of a Bid shall indicate the Contractor has examined the Site and Drawings and has included all required allowances in this Bid. No allowance shall be made for errors resulting from the Contractor's failure to visit job sites and to review Drawings.

D. Division 21 Work: Includes the following system types:

1. Wet-Pipe Sprinkler System.
2. Clean-Agent Fire-Extinguishing System.

E. Delegated-Design: For sprinkler systems indicated to comply with performance requirements and design criteria, including analysis data by a NICET Level III certified designer or licensed Professional Engineer responsible for their preparation.

1. Everything necessary for the complete and successful operation of this system, whether or not definitely specified on the Drawings shall be furnished and installed as if specified or indicated.

1.4 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design system for Class A, B, and C fires as appropriate for areas being protected, and include safety factor.

B. Fire-extinguishing system design shall be approved by authorities having jurisdiction and shall be in accordance to architectural drawings and code plans.

1.5 WORK BY OTHERS

A. Painting.

B. Wiring by Division 26.

C. Water Service into Building.

1.6 ALTERNATES

A. Refer to Division 01 for Alternates.

1.7 CONTINGENCY

A. Refer to Division 01 for amount to include in Mechanical Bid.

1.8 SUBMITTALS

A. General:

1. Preferred Submittal Format: PDF, unless otherwise noted.
2. Preferred Submittal Nomenclature: Unless otherwise noted, PDF submittals are to be named according to the following:
   a. [Specification Section Number] – [Specification Name or Equipment Included]
3. Distribution: Unless otherwise noted, direct all correspondence concerning Division 21 submittals to:

Terry Hammer
PRAIRIE ENGINEERING, P.C.
1905 17TH STREET SE
MINOT, ND 58701
thammer@prairieengineeringpc.com

B. Substitution and Prior Approval to Quote.

1. Format and Content: Complete descriptive technical data on the proposed item consisting of model numbers, type, size and performance characteristics.
2. Submission Timing: Minimum of 192 hours (eight days) prior to bid opening.
    a. Substitutions will not be permitted after bid opening except where such substitution is considered by the Engineer to be in the best interest of the Owner.
3. Bidder Notification: Prior to bid opening via Addenda, sent to all planholders.
4. Contractor Responsibility: This contractor will be responsible for all coordination, construction costs, and Architectural/Engineering design fees required to substitute equipment that has different characteristics than designed including weights, physical dimensions, clearances, mechanical characteristics, electrical characteristics, and other characteristics deemed important to the design by the Architect/Engineer.
5. Alternative Format: Printed paper, two copies; Self-addressed, stamped envelope required for return reply.

C. Schedule of Values.

1. Format and Content: When included with the Bid, at minimum the following categories shall be indicated:
    a. “Sprinkler Riser”
    b. “Controls”
    c. “Wet Pipe Suppression System”
    d. “Clean Gas Agent Suppression System”
2. Submission Timing: Prior to first payment application.

D. Shop Drawings: Submit to Engineer via the Prime Contractor for each item indicated.

1. Format and Content: Include catalog numbers, performance data, dimensions and other descriptive information.
2. Contractor Review: Dated and signed cover sheet or review stamp for each Shop Drawing file to indicate thorough review. **Email message text not acceptable**.
3. Non-Conforming: Returned to Contractor without review.
4. Submission Timing: Prior to delivery of materials to job site.

E. Shop Drawings, Wet-pipe Sprinkler Systems:

1. Include plans, elevations, sections, details, and attachments to other work.
2. Wiring Diagrams: For power, signal, and control wiring.
3. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction, including hydraulic calculations if applicable.

F. Shop Drawings, Clean-agent Fire-extinguishing System: signed and sealed by a qualified professional engineer.

1. Include plans, elevations, sections, details, and attachments to other work.
2. Include design calculations.
3. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
4. Wiring Diagrams: For power, signal, and control wiring.

G. Field Test Reports and Certificates: Indicate and interpret test results for compliance with performance requirements and as described in NFPA 13. Include "Contractor's Material and Test Certificate for Aboveground Piping."

H. Record Drawings

1. Format and Content: Paper copy of Drawings project site.

a. As work progresses, Contractor's field supervisor shall mark Record Drawings in red pencil to indicate actual conditions of installation.
b. Give particular attention to marking actual locations of underground piping.
c. Affix all addendum and change order descriptions to appropriate record drawing sheet, utilizing spray adhesive.
d. Make Record Drawings available to Engineer during project visitation.

2. Submission Timing: Close of project with Record Manuals.

I. Spare Equipment and Devices

1. Distribution: Owner.
2. Format and Content: List quantities on contractor letterhead or invoice, obtain signature of Owner's representative acknowledging receipt, and include with each Record Manual.
3. Submission Timing: Close of project with Record Manuals.

J. Operation and Maintenance Manuals

1. Submission Timing: Close of project, as condition of its acceptance.
2. Record Manual information shall be included for all equipment/material where Shop Drawings are required.
3. Format and Content: Two copies, Loose-leaf hardcover binders, **and** in PDF format on CDs.
   a. List project name, date, Contractor's name, address and telephone number on exterior label of each Record Manual and CD or USB drive.
   b. Include an index sheet indicating subcontractor and subcontractor’s phone number; and each major piece of equipment, supplier and supplier's telephone number. Provide tabbed dividers indicating major groupings of equipment.
   c. Include a copy of the Shop Drawings.
   d. Include all installation, operation and maintenance data packaged with any equipment.
   e. Include all signed and dated final punch lists from walkthroughs performed by the Engineer.

1.9 APPLICATIONS FOR PAYMENT

A. Refer to Division 1 "Applications for Payment".

B. Provide one additional copy, sent directly to the Engineer.

C. Schedule of Values: At minimum, include items in Submittal article.

1.10 CHANGES TO CONTRACT

A. Any required changes to the contract after bid date shall be in accordance with General Conditions/Division 1 and this section. Where any discrepancies between the sections are encountered, the more restrictive section shall apply.

B. Proposed changes shall be accompanied with complete substantiating documentation.

1. Provide an itemized list of quantities for materials, equipment, and supplies.
   a. Include unit costs for each item and extended price.
   b. Include unit labor for each item and extended time.
2. Provide subcontractor proposals that include the same substantiating documentation.
3. Provide quotations from suppliers for any specially ordered equipment.

C. Material costs shall be actual costs to the contractor, obtaining the materials through normal supply channels, including trade and quantity discounts. Utilizing “suggested pricing” from national pricing organizations for unit costs shall not be accepted. Upon request, the contractor or subcontractor shall submit evidence to substantiate the costs.

D. Labor units shall be industry accepted standard labor hours to perform one unit of work. If the work is being performed in a location that is not considered to be standard working conditions for that specific task, additional labor shall be itemized.

E. Labor rates shall be the actual rate paid for the workman category along with associated labor burden. Labor burden shall consist only of the mandatory fringe benefits, labor taxes, and labor insurances as affected by payroll. The owner reserves the right to reject any labor burden which is inconsistent with other similar contractors or where the fringe benefit cost is in excess of established labor agreements.

F. Allowable markups for contractor and subcontractors

1. Overhead on work performed by own forces: 12% maximum.
2. Profit on work performed by own forces: 10% maximum.
3. Commission on work performed by Subcontractors: 5% maximum.
4. Sales tax.
5. Bond and permit increases where applicable.

G. No additional markups shall be allowed for:

1. Field and/or office supervision/administration time.
2. Tool burden.
3. Shop burden.
4. Overhead/Profit applied to work performed by others.

H. Additional costs for travel and subsistence shall only be allowed if the proposal includes a request for extension of the completion date. Furthermore, those costs shall be proportional to the number of working days of the extension.

I. Subcontractors shall compute their costs in the same manner as the contractor. Subcontractors are subject to the same markup constraints as described herein.

J. For changes resulting in credit to the costs, no restocking fees for materials shall be applied by the contractor or subcontractors.

1.11 AUTHORITIES AND AGENCIES

A. All work will be installed for the approval and acceptance of the following:

1. Insurance Services Office
2. State Fire Marshall
3. Local Fire Inspection Office

B. Any permits for the installation or construction of any of the work included in this section, which are required by any of the Authorities or Agencies having jurisdiction, shall be obtained and paid for by the Fire Protection Contractor.

C. All inspections, examinations and tests of any of the work included in this section, which are required by any of the Authorities or Agencies having jurisdiction, shall be obtained and paid for by the Fire Protection Contractor.

1.12 QUALITY ASSURANCE

A. Qualifications of Installers

1. For installation and testing, use only trained licensed and experienced workmen familiar with items required and manufacturer's recommended methods.
2. In acceptance or rejection of installed work, no allowance will be made for lack of skill on the part of the workmen.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.13 WARRANTY

A. The entire Fire Protection installation, as specified under this Section of the Specifications, shall be guaranteed for one (1) year against defective equipment, materials and workmanship. The liability of the Fire Protection Contractor under this guarantee is limited to repair or replacement of fire protection defective equipment, materials or workmanship. The guarantee period is to begin on the date the equipment is placed in operation at the Owner's request for his convenience or from the date a successful acceptance test is made, whichever occurs first.

B. The guarantee shall not be construed as requiring the Fire Protection Contractor to render service or maintenance required in the normal operation of the equipment or to make repairs that may be needed due to normal wear and tear or the Owner's negligence, abuse or breakage.

1.14 TEMPORARY FACILITIES

A. Refer to Special Conditions and/or Division 1 for details of temporary facilities.

PART 2 - PRODUCTS

2.1 MATERIAL

A. All material, equipment, valves and devices, installed or furnished under this Section, shall be listed or approved for use in the Fire Protection installation by the Authorities, Agencies, Codes and Standards named in this Section of the Specification.

1. Underwriter's Laboratories - Approved Fire Protection Equipment List
2. Factory Mutual Approved Equipment Manual

B. Material and equipment shall be as shown or specified. Provide material not specifically described but required for a complete and proper installation of the Work, subject to the acceptance of the Engineer.

C. Owner will not be liable for material installed in non-compliance with codes, standards, and these Contract Documents.

D. Fire Stop System material shall be by 3M “Fire Barrier”, Metacaulk, Hilti, Nelson Firestop Products, or AD Fire. See Division 07 for further details on approved materials.

2.2 ELECTRIC WIRING

A. The Division 21 Contractor shall furnish and install all water flow switches, air pressure switches and alarms, valve supervisory switches, visual/audible alarms, fire pump and controller, control panels, pre-action detection devices, air compressor and controls, special controls and electrical devices as specified herein for proper operation of the equipment furnished.

B. The Division 23 Contractor shall furnish and install all ventilation equipment and dampers, unless otherwise noted in the Drawings or Specifications.

C. Division 26 Contractor shall furnish and install, as required, wiring to supervisory switches, flow switches and alarms furnished separately by Division 21 Contractor, unless otherwise noted in Equipment Specifications.

1. Clean Agent Fire Extinguishing System: Division 26 Contractor shall furnish and install, as required, 120 volt wiring to control panels, and interface wiring for equipment shut down.

PART 3 - EXECUTION

3.1 GENERAL

A. Engineer, Architect, or Owner shall not be responsible for the means, methods, techniques, sequences or procedures of construction selected by Contractor.

B. Engineer, Architect, or Owner shall not be responsible for safety precautions and programs incidental to work of Contractor.

C. It is the sole responsibility of Contractor to initiate, maintain, and supervise all safety precautions and programs in connection with the Work.

D. In general, it is intended that piping be installed parallel to building lines, unless otherwise shown on the Drawings, and that equipment be located symmetrical with the architectural elements of the building.

E. Install piping above grid ceilings to allow easy removal of ceiling tiles. Install exposed piping as high as possible except where noted otherwise.

3.2 SURFACE CONDITIONS

A. Prior to work, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

B. Verify that work of this Division may be installed in accordance with all pertinent codes, regulations and standards.

3.3 PRODUCT HANDLING

A. Protection: Use all means necessary to protect the materials of this Division before, during and after installation and to protect the installed work and materials of all other trades.

B. Plugs: Install in ends of uncompleted piping at end of each day or when work stops.

C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

3.4 COORDINATION

A. Order equipment and material in a timely fashion to assure it is on the job site when required.

B. Coordinate installation of material with schedule of other trades to prevent unnecessary delay in construction schedule.

C. Coordinate pipe routing with other trades to avoid conflicts with ductwork and other piping system.

D. Division 21 piping and equipment installations shall comply with National Electrical Code requirements 110.26 "working spaces" and "dedicated spaces". Pipes shall not be installed in the space near electrical panels/equipment defined as "working spaces" or "dedicated spaces".

3.5 DISCREPANCIES, CONSTRUCTION CONFLICTS AND DRAWINGS

A. Discrepancies

1. Prior to submitting bid, Contractor shall refer any apparent discrepancies or omissions to Engineer for clarification.
2. The Architect, Engineer or Owner will not be responsible for any oral instructions or modifications to the contract documents prior to opening of bids.
3. Written interpretation or clarification will be made by Addenda.

B. Construction Conflicts

1. Conflicts discovered during construction shall be immediately called to the attention of the Engineer for decision.
2. Do not proceed with installation in area of question until conflict has been fully resolved.
3. When so directed by Engineer, Contractor shall make minor adjustment to avoid interferences with other trades. Such minor adjustments shall be performed at no additional cost to the Architect, Engineer or Owner.

C. Drawings

1. Refer to the architectural drawings for dimensions and locations of walls, partitions, doors, windows, ceiling heights, door swings and other details of construction.

3.6 UNDERGROUND UTILITIES

A. Locations of existing underground utilities are based on available site information and are shown approximately. Contractor shall determine exact utility locations before commencing work and shall be responsible for repair of damages resulting from his construction activities.

B. Trench and backfill for installation of underground piping to depth shown or required. Remove any accumulated water in excavation by pumping. Shore and brace excavation as required by safety regulations. Provide temporary bridges to maintain normal traffic flow. Excavation and backfill required by mechanical installations shall be accomplished in accordance with Division 31 Specifications by this Contractor.

3.7 CUTTING AND PATCHING

A. Refer to General Conditions. Unless specifically called out to be performed by other Contractors, the Division 21 Contractor shall perform all cutting and patching required for the installation of material and equipment furnished under his Contract.

B. Opening/holes cut to allow passage of pipes through concrete floor shall be patched by the Contractor doing the cutting unless indicated otherwise on the Drawings.

C. Fire-Barrier Penetrations

1. Pipe penetrations through fire rated walls and floors shall be sealed with a UL classified Fire Stop System. Fire Stops shall be provided in accordance with the appropriate System No. as it relates to pipe size/Material and wall or floor rating/material.
2. See Specification Section 210510 for other Fire-Barrier Penetration requirements.
3. See Section 2 article “Materials” of this Specification for approved fire stop system material.

D. Restore damaged surfaces to their original condition by skilled mechanics of the trade involved. Contractor at fault shall assume all cost.

E. Use only rotary type drilling tools to cut concrete.

F. Do not endanger the stability of the structure. Do not at any time cut or alter work of any other Contractor without Architect's consent.

3.8 FIELD QUALITY CONTROL

A. Perform field tests and inspections. Test new piping and parts of existing piping that have been altered, extended, or repaired.

B. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained. Piping will be considered defective if it does not pass tests and inspections.

3.9 INSTRUCTIONS

A. Provide written and oral operating and maintenance instructions to Owner's representatives. The oral instructions shall be given before the Owner occupies the buildings. Written instructions shall be graphical insofar as practical.

B. Division 21 Contractor shall coordinate with Owner at Owner's convenience, formal instruction time for contractor personnel to instruct Owner's Representatives on all equipment.

END OF SECTION

SECTION 210510 – COMMON WORK RESULTS FOR FIRE PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Hangers.
2. Escutcheons.
3. Equipment and Warning labels.
4. Pipe labels.
5. Fire-Barrier Penetrations.

1.2 SUBMITTALS

A. Shop Drawings: For equipment covered under this section as per Section 210500.

1. Fire-Barrier Penetrations: UL Classified System, System Number.

B. Operation and Maintenance Manual: Per section 210500.

PART 2 - PRODUCTS

2.1 METAL PIPE HANGERS AND SUPPORTS

A. All hangers, installed or furnished under this Section, shall be listed or approved for use in the Fire Protection installation by the Authorities, Agencies, Codes and Standards named in this Section of the Specification.

B. Carbon-Steel Pipe Hangers and Supports:

1. Description: Clevis type with locknut to threaded extension rod, factory-fabricated components; MSS SP-58 types 1 through 58.
2. Galvanized Metallic Coatings: Pregalvanized or hot dipped.
3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
5. Hanger Rods: Continuous-thread rod, nuts, and washer made of galvanized or cadmium plated steel.

C. Copper Pipe Hangers:

1. Description: Clevis type with locknut to threaded extension rod, copper-coated-steel, factory-fabricated components; MSS SP-58 types 1 through 58.
2. Hanger Rods: Continuous-thread rod, nuts, and washer made of galvanized steel.

D. Trapeze Pipe Hangers:

1. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.2 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.3 ESCUTCHEONS

A. One-Piece, Cast-Brass Type: With polished, chrome-plated finish and setscrew fastener.

2.4 EQUIPMENT AND WARNING LABELS

A. General Requirements

1. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
2. Minimum Letter Size: 1/2 inch for name of units. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
3. Fasteners: Stainless-steel rivets or self-tapping screws.
4. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Metal Labels for Equipment:

1. Material and Thickness: Non-corroding metal, 20 gauge minimum thickness, and having predrilled or stamped holes for attachment hardware.

C. Plastic Labels for Equipment and Warning:

1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
2. Equipment Label Color: Black letters on white background.
3. Warning Label Color: White letters on red background.
4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

D. Warning Label Content: Include caution and warning information, plus emergency notification instructions.

E. Equipment Label Content: Include equipment's Drawing designation or unique equipment number.

F. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing plan numbers where equipment is indicated, plus the Specification Section number and title where equipment is specified. Equipment schedule shall be provided to the Controls Contractor and included in operation and maintenance data.

2.5 PIPE LABELS

A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.

B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.

C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.

D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.

1. Lettering Size: At least 1-1/2 inches high.

2.6 FIRE-BARRIER PENETRATIONS

A. Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with Approved firestop materials. See Section 210500 for further details.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT INSTALLATION

A. Metal Pipe-Hanger Installation: Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.

B. Metal Trapeze Pipe-Hanger Installation: Arrange for grouping of parallel runs of horizontal piping, and support together on trapeze pipe hangers.

C. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

D. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

E. Install lateral bracing with pipe hangers and supports to prevent swaying.

F. Install hangers and supports to not exceed maximum pipe deflections allowed by NFPA 13 for fire sprinkler piping.

G. Comply with NFPA 13 for pipe-hanger selections and applications.

H. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

I. Use carbon-steel pipe hangers and supports and metal trapeze pipe hangers and attachments for general service applications.

J. Use copper-plated pipe hangers and copper attachments for copper piping and tubing.

K. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
2. Steel Clevises (MSS Type 14): For 120 to 450 °F piping installations.

L. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
3. Side-Beam or Channel Clamps (MSS Type 20 or 25): For attaching to bottom flange of beams, channels, or angles.
4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
6. C-Clamps (MSS Type 23): For structural shapes.
7. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod.

M. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.

N. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.

3.2 EQUIPMENT LABEL INSTALLATION

A. Install or permanently fasten labels on each major item of fire protection equipment.

B. Locate equipment labels where accessible and visible.

3.3 PIPE LABEL INSTALLATION

A. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:

1. Near each branch connection, excluding short takeoffs for fixtures and terminal units.
2. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
3. At access doors, manholes, and similar access points that permit view of concealed piping.
4. Near major equipment items and other points of origination and termination.
5. Spaced at maximum intervals of 50 feet along each run.

3.4 ESCUTCHEON AND FLOOR PLATE INSTALLATION

A. Install escutcheons for exposed piping penetrations of walls, ceilings, and floors of finished areas.

B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.

C. Replace broken and damaged escutcheons using new materials.

3.5 FIRE-BARRIER PENETRATION PROTECTION

A. Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials.

B. Install Fire Stop Systems per the manufacturers guidelines.

END OF SECTION

SECTION 211000 – FIRE SPRINKLER SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Wet-pipe sprinkler system.

1.2 SYSTEM DESCRIPTIONS

A. Wet-Pipe Sprinkler System: Automatic sprinklers are attached to piping containing water and that is connected to water supply through alarm valve. Water discharges immediately from sprinklers when they are opened. Sprinklers open when heat melts fusible link or destroys frangible device. Hose connections are included if indicated.

1.3 RELATED SECTIONS

A. Refer to Section 210520 “General Motor Requirements” for motor requirements.

B. Refer to Section 210500 “Common Work Results for Results For Fire Protection” for requirements of hangers, sleeves, sleeve seals, escutcheons, and labels.

1.4 SUBMITTALS

A. Shop Drawings: As per Section 210500 and prepared according to NFPA 13.

1. Materials: As covered under this section.
2. Wiring Diagrams: For power, signal, and control wiring.
3. Approved Sprinkler Piping Drawings: Working plans that have been approved by authorities having jurisdiction.
4. Water Supply Capacity Information: Include flow test data.
5. Approved Hydraulic Calculations: Include summary sheet, detailed worksheets, and a graph sheet.

B. Operation and Maintenance Data: Per section 210500.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:

1. Installer's responsibilities include designing, fabricating, and installing sprinkler systems and engineering services.
2. Experience: Minimum of 2 years in the successful installation and operation of Fire Protection systems.

B. NFPA Standards: Sprinkler system equipment, specialties, accessories, installation, and testing shall comply with the following:

1. NFPA 13, "Installation of Sprinkler Systems."

1.6 UTILITY DATA FOR BIDDING

A. Available fire-hydrant flow test records indicate the following conditions and are provided on a preliminary basis to enable bidding the project:

B. Flow Test for Hydrant SO2MN.

1. Date: 10/25/2021

2. Performed by: Chris L. Aberle.
3. Location of Test Fire Hydrant: South Main/Second Ave SE.
4. Static Pressure: 61 psig.
5. Measured Flow: 6111 gpm.
6. Residual Pressure: 48 psig.
7. Flow Hydrants: SW0201, SW02BW and SE0201; 2.5" Port Diameters.

C. Flow Test for Hydrant SO3MN.

1. Date: 10/25/2021
2. Performed by: Austin T. Burns
3. Location of Test Fire Hydrant: South Main/Third Ave. SE
4. Static Pressure: 56 psig.
5. Measured Flow: 5849 gpm.
6. Residual Pressure: 46 psig.
7. Flow Hydrants: SW0301, SW03BW and SE0301; 2.5" Port Diameters.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pressure Rating: 175 psig minimum unless otherwise noted.

2.2 FIRE-DEPARTMENT CONNECTIONS

A. Description: Flush-Type, Fire-Department Connection.

1. Standard: UL 405.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Elkhart Brass Mfg. Company, Inc.
2. Potter Roemer.

C. Type: Flush, for wall mounting.

D. Body Material: Corrosion-resistant metal.

E. Inlets: Brass with threads according to NFPA 1963 and matching local fire-department sizes and threads. Include extension pipe nipples, brass lugged swivel connections, and check devices or clappers.

F. Caps: Brass, lugged type, with gasket and chain.

G. Escutcheon Plate: Rectangular, brass, wall type.

2.3 BACKFLOW PREVENTION

A. Double Check Valve Backflow Preventer Assembly:

1. Description: Double check valve assembly with UL/FM approved valves on inlet and outlet of assembly.
2. Assembly Standard: ASSE 1015, AWWA C510-07
3. Check Valves:
    a. Type: Swing check.
    b. Body Material: Epoxy coated cast iron.
    c. Seats: Bronze.
4. Shut-off Valves:

a. OS&Y gate valve, UL 262.
b. Butterfly valves.
c. Provide valve supervisory switches at each valve.

2.4 ALARM DEVICES

A. Alarm-device types shall match piping and equipment connections.

B. Water-Flow Indicators:

1. Standard: UL 346.
2. Water-Flow Detector: Electrically supervised.
3. Pressure Rating: 250 psig.

C. Valve Supervisory Switches:

1. Standard: UL 346.
2. Type: Electrically supervised.
3. Design: Signals that controlled valve is in other than fully open position.

2.5 SPRINKLERS

A. General Requirements:

1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.

B. Automatic Sprinklers with Heat-Responsive Element:

1. Early-Suppression, Fast-Response, Applications: UL 1767.
2. Nonresidential Applications: UL 199.
3. Residential Applications: UL 1626.

2.6 FLEXIBLE SPRINKLER HOSE

A. Description: Flexible sprinkler hose fittings for use in commercial suspended ceilings and sheetrock ceilings.

1. Standard: UL 2443.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. FlexHead Industries, Inc.
2. Easyflex.
3. Victaulic.
4. Rascoflex.

C. Materials: Fully welded non-mechanical fittings, braided, leak-tested with minimum 1 inch true-bore internal hose diameter.

1. Braiding: Type 304 stainless steel.
2. Nut and Nipple: Galvanized steel.
3. Gaskets: EPDM/Nylon.
4. Ceiling Bracket: Galvanized steel.
5. Ratings: 175 psi and 225°F.

2.7 AUDIBLE VISUAL ALARMS

A. Description: Weatherproof, strobe/horn unit, wall mounted, UL listed.

B. Strobe: Xenon flash, high impact lens.

1. Effective Candle Power: Minimum 15.0.
2. Peak Candle Power: 135,000.

C. Horn: 95dBA.

PART 3 - EXECUTION

3.1 SERVICE-ENTRANCE PIPING

A. Connect fire-protection standpipe piping to flange provided by mechanical contractor on water-service piping at service entrance into building.

B. Install shutoff valve, backflow preventer, pressure gage, drain, and other accessories at connection to fire-protection water-service piping.

3.2 PIPING INSTALLATION

A. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated, as far as practical.

B. Install drain valves on standpipes. Extend drain piping to outside of building.

C. Install automatic (ball drip) drain valves to drain piping between fire-department connections and check valves. Drain to floor drain or outside building.

D. Install alarm devices in piping systems.

E. Install escutcheons for piping penetrations of walls, ceilings, and floors.

F. Bushings of any type to obtain reduction in size in fittings are not acceptable.

3.3 VALVE AND SPECIALTIES INSTALLATION

A. Install listed fire-protection valves, trim and drain valves, specialty valves and trim, controls, and specialties according to NFPA 13 and authorities having jurisdiction.

B. Install listed fire-protection shutoff valves supervised open, located to control sources of water supply except from fire-department connections. Install permanent identification signs indicating portion of system controlled by each valve.

C. Install check valve in each water-supply connection. Install backflow preventers instead of check valves in potable-water-supply sources.

D. Specialty Valves:

1. General Requirements: Install in vertical position for proper direction of flow, in main supply to system.
2. Alarm Valves: Include bypass check valve and retarding chamber drain-line connection.

E. Install audible visual alarm above fire department connection.

3.4 SPRINKLER HEAD INSTALLATION

A. Location of Sprinkler Heads: As shown on the shop drawings.

1. Placed in the center of the ceiling tiles when practical.
2. Avoid lights, ceiling grid, and other devices mounted in the ceiling tiles.

3.5 FLEXIBLE SPRINKLER HOSE INSTALLATION

A. Install flexible sprinkler hose connections to heads in all areas with a finished suspended or sheetrock ceiling.

1. Exceptions: Where limited space is a factor and minimum bend radius is not possible.
    a. Verify these locations with design engineer and indicate them on the Fire Sprinkler Shop Drawings.

B. Mount heads to bracket system manufactured by same manufacturer as flexible connector drops.

C. Do not over-bend flexible hose. Do not exceed manufacturer recommended minimum radius.

3.6 IDENTIFICATION

A. Install labeling and pipe markers on equipment and piping according to requirements in NFPA 14.

B. Identify system components, wiring, cabling, and terminals.

3.7 HYDROLIC ELEVATOR HOISTWAYS AND ELEVATOR MACHINE ROOMS

A. Install sidewall spray sprinkler within 2 feet of the pit floor for hydraulic elevators.

B. Install upright or pendent type sprinklers at the top of the elevator hoistway.

C. Provide ordinary or intermediate temperature rated sprinkler heads in elevator hoistways or machine rooms.

D. Provide manual shutoff valve with tamper switch and flow switch on sprinkler line that serves the elevator hoistway and the elevator machine room. Flow switch shall be of the type with no time delay.

3.8 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Fire Sprinkler Service Piping Tests: Test service piping as required by the Authority Having Jurisdiction or, in absence of published procedures, as follows:
2. Witness: Test shall be performed in the presence of the Authority Having Jurisdiction or the representative of the Owner.
3. Testing: Before the joints are covered in order for leaks to be detected.
4. Pressure: Minimum of 200 psig, if maximum static pressure is 150 psig or greater the pressure test shall be 50 psig greater than maximum pressure test.
5. Duration: Two (2) hours.
6. Leakage Rate: Not to exceed two quarts/hr per 100 joints or gaskets irrespective of pipe diameter. Leakage for metal seated valves may increase above leakage rate by one fluid ounce per inch valve diameter per hour for each metal seated valve isolating the test section.
7. Control Valves: Operating test shall be performed on all control valves when system is under full pressure to ensure proper operation.
8. Certification: Upon completion, this Contractor shall complete the “Contractor’s Material & Test Certificate For Underground Piping” contained in NFPA 2 and submit copies to the Owner, Engineer, Local Fire Chief and ISO Commercial Risk Services, Inc.
9. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
10. Flush, test, and inspect sprinkler systems according to NFPA 13, "System Acceptance" Chapter.
11. Flush, test, and inspect standpipe systems according to NFPA 14, "System Acceptance" Chapter.
12. Energize circuits to electrical equipment and devices.
13. Coordinate with fire-alarm tests. Operate as required.
14. Coordinate with fire-pump tests. Operate as required.

15. Verify that equipment hose threads are same as local fire-department equipment.

3.9 BACKFLOW PREVENTION SCHEDULE

A. Double Check Valve Assembly: Wet and dry systems.

3.10 SPRINKLER SCHEDULE

A. Provide sprinkler types in subparagraphs below with finishes indicated.

1. Flush Concealed Sprinklers: Rough brass, with white cover plate; install in areas with finished ceilings except Council Chambers which shall have black cover plates.
2. Upright, Pendent, and Sidewall Sprinklers: White in finished spaces exposed to view with no ceilings in Public Areas where the exposed structure and piping will be painted; rough bronze in unfinished spaces with no ceilings not exposed to public view and no painting of exposed structure.

END OF SECTION

SECTION 212200 – CLEAN AGENT FIRE EXTINGUISHING SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Clean-agent fire-extinguishing system.

1.2 SYSTEM DESCRIPTIONS

A. Clean-Agent Fire-Extinguishing System: An engineered total flooding clean agent fire extinguishing system.

1.3 RELATED SECTIONS

A. Refer to Section210510 “Common Work Results for Fire Protection” for requirements of hangers, sleeves, sleeve seals, escutcheons, and labels.

1.4 SUBMITTALS

A. Shop Drawings: As per Section 210500 and prepared according to NFPA 2001.

1. Materials: As covered under this section.
2. Wiring Diagrams: For power, signal, and control wiring.
3. Approved Drawings: Working plans that have been approved by authorities having jurisdiction.
4. Approved Calculations: Include version of calculation program.
5. Enclosure Integrity Testing Equipment and Software: State make and model of test fan and software as well as last calibration date.

B. Operation and Maintenance Data: Per section 210500.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:

1. Installer's responsibilities include designing, fabricating, and installing sprinkler systems and engineering services.
2. Experience: Minimum of 5 years in the successful installation and operation of clean-agent fire extinguishing systems.
3. The installation Contractor shall be an authorized stocking distributor for the equipment specified and provide 24 hour emergency service.

B. FM Global Compliance: Provide components that are FM Approved and that are listed in FM Global's "Approval Guide."

C. UL Compliance: Provide equipment listed in UL's "Fire Protection Equipment Directory."

D. NFPA Standards: Clean-agent system equipment, specialties, accessories, installation, and testing shall comply with the following:

1. NFPA 2001, “Standard for Clean Agent Fire Extinguishing Systems.”
2. NFPA 72, “National Fire Alarm Code”.

PART 2 - PRODUCTS

2.1 CLEAN-AGENT SYSTEMS

A. Except in other Part 2 articles where noted, the following manufacturers are acceptable:

1. Fenwall Fire Suppression System; KIDDE-FENWAL, Inc.
2. Fike Protection Systems; Fike Corporation.
3. SAPPHIRE Fire Suppression System; Tyco Fire Protection Products.
4. Minimax Fire Suppression System; Minimax Fire Products.
5. Viking Fire Suppression System; Viking Group Inc.

B. All manufacturers are subject to compliance with requirements

C. Provide products by one of the manufacturers specified or by prior approval.

2.2 SYSTEM PERFORMANCE

A. System Discharge

1. The discharge time required to achieve 95% of the minimum design concentration for flame extinguishment shall not exceed 10 seconds.

B. Duration of Protection

1. 85% of the minimum design concentration shall be maintained for 10-minutes or a sufficiently longer period of time to allow effective emergency action by trained personnel. A level 1 certification in room integrity testing, provided by a recognized manufacturer of room integrity testing equipment, is required.

C. Cross-Zoned Detection: Devices located in two separate zones. Sound alarm on activating single-detection device, and discharge extinguishing agent on actuating single-detection device in other zone.

D. System Operating Sequence:

1. Actuating First Detector: Visual indication on annunciator panel. Energize audible and visual alarms (slow pulse), shut down air-conditioning and ventilating systems serving protected area, and send signal to fire-alarm system.
2. Actuating Second Detector: Visual indication on annunciator panel. Energize audible and visual alarms (fast pulse), shut down power to protected equipment, start time delay for extinguishing-agent discharge for 30 seconds.
3. Discharge extinguishing agent at end of time-delay period.

E. Manual stations shall immediately discharge extinguishing agent when activated.

F. Operating abort switches will delay extinguishing-agent discharge while being activated, and switches must be reset to prevent agent discharge. Release of hand pressure on the switch will cause agent discharge if the time delay has expired.

G. Manual EPO Switch: Will terminate power to protected equipment immediately on actuation.

H. Low-Agent Pressure Switch: Initiate trouble alarm if sensing less than set pressure.

2.3 MATERIALS, EQUIPMENT, VALVES AND DEVICES

A. All material, equipment, valves and devices, installed or furnished under this Section, shall be listed or approved for use in the Fire Protection installation by the Authorities, Agencies, Codes and Standards named in this Section of the Specification.

1. Underwriter's Laboratories - Approved Fire Protection Equipment List
2. Factory Mutual Approved Equipment Manual.

B. Piping, Valves, and Discharge Nozzles: Comply with types and standards listed in NFPA 2001, Section "Distribution," for charging pressure of system.

2.4 CONTROL PANELS

A. Description: FM Approved or NRTL listed, including equipment and features required for testing, supervising, and operating fire-extinguishing system.

B. Power Requirements: 120/240-V ac; with electrical contacts for connection to system components and fire-alarm system, and transformer or rectifier as needed to produce power at voltage required for accessories and alarm devices.

C. Enclosure: NEMA ICS 6, Type 1, enameled-steel cabinet.

D. Supervised Circuits: Separate circuits for each independent hazard area.

1. Detection circuits equal to the required number of zones, or addressable devices assigned to the required number of zones.
2. Manual pull-station circuit.
3. Alarm circuit.
4. Release circuit.
5. Abort circuit.
6. EPO circuit.

E. Control-Panel Features:

1. Electrical contacts for shutting down fans, activating dampers, and operating system electrical devices.
2. Storage container, low-pressure indicator.
3. Service disconnect to interrupt system operation for maintenance with visual status indication on the annunciator panel.
4. Connection for fire alarm monitoring.

2.5 MANUAL STATIONS

A. General Description: Surface mounted, with clear plastic hinged cover. Include contacts for connection to control panel.

B. Manual Release: "MANUAL RELEASE" caption, and red finish.

C. Abort Switch: "ABORT" caption, with green finish.

D. EPO Switch: "EPO" caption, with yellow finish.

2.6 DETECTION DEVICES

A. General Requirements for Detection Devices: Comply with NFPA 2001, NFPA 72, and UL 268.

B. Ionization Detectors: Dual-chamber type, having sampling and referencing chambers, with smoke-sensing element.

C. Photoelectric Detectors: LED light source and silicon photodiode receiving element.

D. Signals to the Central Fire Alarm Control Panel: Any type of local system trouble is reported to the central fire alarm control panel as a composite "trouble" signal. Alarms on each system zone are individually reported to the central fire alarm control panel as separately identified zones.

2.7 ALARM DEVICES

A. Description: Listed and labeled by an NRTL or FM Approved, low voltage, and surface mounting.

B. Bells: Minimum 6-inch diameter.

C. Horns: 90 to 94 dBA.

D. Strobe Lights: Translucent lens, with "FIRE" or similar caption.

2.8 SIGNAGE

A. Area Caution Sign: Indicate area is protected by a fire suppression system; include warning to vacate area when alarm activates.

1. Include installer contact information.

B. Alarm Stage Sign: Provide signage to explain significance of audible tones with regards to 1st alarm stage, 2nd alarm stage, and discharge.

C. Manual Stations: Provide signage to indicate Bypass Switch, Abort Station, Release Station.

PART 3 - EXECUTION

3.1 CLEAN AGENT FIRE EXTINGUISHING SYSTEM INSTALLATION AND TESTING

A. The system shall be supplied and installed by a factory-authorized Distributor. The Distributor shall be trained and certified by the factory to design, install and maintain the fire suppression system. The distributor shall install the system in accordance with the manufacturer's design, installation, operation and maintenance manual.

B. All pipe length must be reamed, blown clear, and swabbed with suitable solvents to remove burrs, mill varnish, and cutting oil before assembly.

C. For threaded fittings. Teflon tape only shall be used and applied to male pipe threads.

D. Enclosure integrity testing shall be performed until system passes hold time, peak positive and peak negative pressure test.

3.2 CLEAN-AGENT STORAGE AND DISTRIBUTION

A. Each protected area shall have its own separate supply of tanks and agent. Each supply shall be located within the hazard area or as near to it as possible so that a minimum of distribution piping is used.

1. The clean-agent shall be stored in an agent storage container. The agent storage container shall be a modular floor mounted of high strength. Low HSLA alloy steel. It shall consist of valve assemble, actuator, pipe union, safety plug, 0-700 psig pressure gauge.
2. Containers shall conform to all applicable specifications of Department of Transportation, underwriters Laboratories, and the Factory Mutual System.
3. Filled containers shall be super-pressurized with dry nitrogen to 360 psig at 70°F to aid in rapid agent distribution, particularly at lower temperatures. The agent storage container shall automatically relieve between 850-1000 psig in the event of excessive pressure build-up.
4. The mounting brackets and pipe supports shall be fastened to rigid support surfaces and structural support members for maintaining mounting integrity.

B. Discharge nozzles shall distribute the clean-agent throughout the protected areas. The nozzle shall be constructed and designed to provide proper distribution and weight of the agent. Ceiling penetrations shall be finished with chrome plated escutcheons.

3.3 ELECTRICAL SYSTEM INSTALLATION

A. All electrical enclosures, raceways, and conduits shall be provided and installed in accordance with applicable codes and intended use, and shall contain only those electrical circuits associated with the fire-detection and control system. No circuit or circuits that are unrelated to the fire alarm or suppression system shall be routed through the enclosures, raceways, and conduits dedicated to the fire alarm or suppression system.

B. Splicing of circuits shall be kept to a minimum, and is only permitted in an electrical box suitable for the purpose. Appropriate hardware shall be used to make the wire splices. Wires that are spliced together shall have the same color insulation.

C. White colored wire shall be used exclusively for the identification of the neutral conductor of an alternating-current circuit. Green colored wire shall be used exclusively for the identification of the earth-ground conductor of an AC or DC circuit. Appropriate color-coding shall be utilized for all other field wiring.

D. All electrical circuits shall be numerically tagged with suitable markings at each terminal point. All circuits shall correspond with the installation draw.

3.4 ROUTINE MAINTENANCE

A. The Contractor shall provide two (2) inspections of each system under this contract during the one-year warranty period. The first inspection to be at the six-month interval after system acceptance and the second at the 12- month interval. Inspections shall include determination of agent container weight and pressure and an actual test of every system device to ensure proper operation of all system components per NFPA 2001. Documentation certifying tests performed and system condition shall be submitted to the Owner.

B. Routine maintenance on equipment shall be performed as recommended by the manufacturer's installation, operation and maintenance manual. At a minimum the routine maintenance will include the following by a factory certified Distributor:

1. Visual Check of Pipe network and distribution nozzles per the operation and maintenance manual.
2. Weight and pressure of the engineered system cylinders per the operation and maintenance manual.
3. Inspect all cylinders and equipment for damage per the operation and maintenance manual.
4. Routine maintenance on the suppression system as a whole shall be performed as recommended by NFPA 2001, current edition.

3.5 INSTRUCTIONS TO OWNERS:

A. Before final payment is made, when equipment has been placed in permanent operation, instruct operating personnel in operation and maintenance of equipment. Furnish Owner with written operating and maintenance instructions in a reasonable number of copies (minimum of two O & M manuals) as determined by the Owner. Such instructions shall be pictorial and graphical insofar as practical. Contractor shall provide video recording of installation to owner.

END OF SECTION

SECTION 220500 – PLUMBING GENERAL PROVISIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Refer to Section 230500 for the General Provisions related to this section.

1.2 SCOPE OF WORK

A. The work covered by this Division consists in furnishing all labor, equipment, accessories and materials and in performing all operations necessary for the installation of the plumbing systems, in strict accordance with Division 22 of this Specification and applicable Drawings and subject to the terms and conditions of the Contract.

B. Division 22 Work: Includes, but is not limited to, providing the following:

1. Potable Water Distribution System: Fixtures, piping, equipment.
2. Waste and Vent Systems: Piping and specialties.

1.3 APPLICATIONS FOR PAYMENT

A. Refer to Division 1 "Applications for Payment".

B. Provide one additional copy, sent directly to the Engineer.

C. Format and content: When included with the Bid, at minimum the following categories shall be indicated on the application for payment:

1. “Project mobilization”
2. “Demolition”
3. “Excavation and Backfill”
4. “Insulation”
5. “Domestic Water Piping System” (all piping, valves, shock arrestors, fittings, hangers, installed in place)
6. “Waste and Vent System” (all piping, valves, fittings, hangers, floor drains, interceptors, installed in place)
7. “Storm and Rain System” (all piping, drains, downspouts, fittings, hangers, drain tile, installed in place)
8. “Plumbing Fixtures” (all fixtures, faucets/flush valves, drain assemblies, water coolers, installed in place)
9. “Plumbing Equipment” (all water heaters, recirculation pumps, expansion tanks, storage tanks, installed in place)

PART 2 - PRODUCTS

2.1 MATERIAL

A. Refer to Section 230500 for the Materials related to this section.

B. Potable-water piping and components shall comply with NSF 14 and NSF 61. Plastic piping components shall be marked with "NSF-pw."

PART 3 - EXECUTION

3.1 GENERAL

A. Refer to Section 230500 for the Executions related to this section.

3.2 FIELD QUALITY CONTROL

A. Perform field tests and inspections. Test new piping and parts of existing piping that have been altered, extended, or repaired.

B. Piping Inspections:

1. Perform tests specified below in presence of authorities having jurisdiction:
2. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing in after roughing in and before setting fixtures.
3. Final Inspection: Arrange for authorities having jurisdiction to observe tests specified in "Piping Tests" Subparagraph below and to ensure compliance with requirements.

C. Water Service Piping Tests: Test water service piping as required by the Authority Having Jurisdiction or the Plumbing Code, or, in absence of published procedures, as follows:

1. Testing: Before the joints are covered in order for leaks to be detected.
2. Pressure: Minimum of 125 psig.
3. Duration: Two (2) hours.
4. Valves: Operating test shall be performed on all valves when system is under full pressure to ensure proper operation. Perform multiple times during test to ensure proper operation.
5. Certification: Backfilling shall not be resumed until test results and work have been approved by Architect/Engineer.

D. Domestic Water, Sanitary, and Vent Piping Tests: Test domestic water, sanitary, and vent piping as required by the Authority Having Jurisdiction or the Plumbing Code, or, in absence of published procedures, as follows:

1. Domestic Water Piping:
    a. Pressure: Minimum of 125 psig.
    b. Duration: Two (2) hours.
2. Sewer, Soil, Waste, Drain and Vent Piping:
    a. Procedure: Close all openings and pressurize with air.
    b. Pressure: Minimum of 5 psig.
    c. Duration: 15 minutes.
    d. System may be tested in its entirety or in sections.
3. Building sewer from the building to the sewer main:
    a. Insert a test plug at the point of connection with the Public sewer.
    b. Pressure: 10 feet water head.
    c. Duration: 15 minutes, constant water level.

E. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained. Piping will be considered defective if it does not pass tests and inspections.

3.3 ADJUSTING

A. Perform the following domestic water adjustments before operation: Check plumbing specialties and verify proper settings, adjustments, and operation.

3.4 DISINFECTION OF POTABLE WATER SYSTEM

A. Clean interior of domestic water, septic, and vent piping systems. Remove dirt and debris as work progresses.

B. New potable water systems shall be disinfected prior to use whenever required by the Authority having jurisdiction. The method to be followed shall be that prescribed by the Health Authority or, in case no method is prescribed by the Health Authority, the following:

1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed follow procedures described below:
    a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
    b. Fill and isolate system according to either of the following:
        i. Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
        ii. Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.
    c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
3. The procedure shall be repeated if it is shown by a bacteriological examination, made by the Authority, that contamination still persists in the system.

C. After all tests have been made and the plumbing systems are operating properly, this Contractor shall go over the entire system and remove labels from all plumbing fixtures.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Ball valves.
2. Check valves.
3. Gauges.

B. Nomenclature:

1. SWP: Steam working pressure.
2. CWP: Cold working pressure.

1.2 RELATED SECTIONS

A. Refer to Section 230510 “Common Work Results for Piping” for following items:

1. Butterfly valves.
2. Hangers.
3. Escutcheons.
4. Equipment and Warning labels.
5. Pipe labels.
6. Equipment supports.

1.3 SUBMITTALS

A. Shop Drawings: For equipment covered under this section as per Section 220500.

B. Operation and Maintenance Manual: Per section 220500.

1. Product Data: Each type of valve, gauge, strainer, sleeve, and sleeve-seal system.

PART 2 - PRODUCTS

2.1 BALL VALVES

A. Two-Piece, Full-Port, Metal, Ball Valves:

1. Standard and Rating: Comply with NSF-61-G; 600 psi CWP at 500°F.
2. Body Design: Two piece
3. Body Material: Forged brass or Bronze.
4. Seats: PTFE or TFE.
5. Stem: Brass or Bronze, blowout-proof, packing nut.
6. Ball: Chrome-plated brass.
7. Port: Full or Regular.
8. Operator: Lever; separate lever nut.

2.2 CHECK VALVES

A. Check Valve – Bronze Swing:

1. Standard and Rating: Comply with NSF-61-G; 200 psig CWP at 350°F.
2. Body Design: Y-pattern.
3. Body Material: ASTM B 62, bronze.

4. Disc: Bronze.

B. Check Valve – Iron, lead free:

1. Basis of Design: Nibco F-910-B-LF, flanged, lead free.
2. Standard and Rating: MSS SP-125; NSF-61-G; 200 psi CWP, 200°F.
3. Body Design: Horizontal inline with sliding disc.
4. Body Material: ASTM A 126, gray iron.
5. Actuator: Stainless steel spring.
6. Seat and Disc: ASTM B584 Bronze.

2.3 MISCELLANEOUS MATERIALS

A. Refer to Section 230510 “Common Work Results for Piping”.

2.4 GAUGES

A. Manufacturers: Refer to Section 230510 “Common Work Results for Piping”.

B. Refer to Section 230510 “Common Work Results for Piping” for the following:

1. Pressure Gauges – Dial Type.

PART 3 - EXECUTION

3.1 VALVE INSTALLATION

A. Refer to Section 230510 “Common Work Results for Piping”.

3.2 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

A. If valve applications are not indicated, use the following:

1. Shutoff Service: Ball, or butterfly valves.
2. Pump-Discharge Check Valves:
   a. 2” and Smaller: Bronze swing check valves with bronze disc.
   b. 2-1/2” and Larger for Sanitary Waste and Storm Drainage: Iron swing check valves with lever and weight or spring.

B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP class or CWP ratings may be substituted.

3.3 DOMESTIC, HOT- AND COLD-WATER VALVE SCHEDULE

A. Pipe 2” and Smaller:

1. Bronze and Brass Valves: May be provided with solder-joint ends instead of threaded ends.
2. Ball Valves: Two piece, full or regular port, brass or bronze.
3. Check Valve – Bronze Swing.

B. Pipe 2-1/2” and Larger:

1. Butterfly Valves.
2. Check Valves: Bronze Swing.

3.4 HANGER AND SUPPORT INSTALLATION

A. Refer to Section 230510 “Common Work Results for Piping” except for items listed below.

B. Pipe Positioning-System Installation: Install support devices to make rigid supply and waste piping connections to each plumbing fixture.

3.5 GAUGE INSTALLATION

A. Refer to Section 230510 “Common Work Results for Piping” except for items listed below.

B. Install pressure gages in the following locations:

1. Building domestic water service entrance into building.

3.6 GAUGE SCALE-RANGE SCHEDULE

A. Scale Range for Domestic Water Piping Pressure Gauge: 0 to 100 psi.

END OF SECTION

SECTION 220600 – WATER SERVICE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Water service pipe.
2. Transition couplings.

B. Nomenclature:

1. SWP: Steam working pressure.
2. CWP: Cold working pressure.

1.2 SCOPE OF WORK

A. The work covered under this Section shall include the furnishing of the labor, equipment and materials necessary for a complete water service to building as shown on Drawings.

1.3 RELATED SECTIONS

A. See Division 31 for Excavation and Backfill.

1.4 SUBMITTALS

A. Shop Drawings: For equipment covered under this section as per Section 220500.

B. Product Data: Provide data on materials in accordance with Section 220500 for all piping, fittings, transition couplings and pipe adapters.

C. Provide records of measured depths of water mains, service leads, valves, connections, transition couplings, adapters, thrust blocking; measured horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements; measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work; and field changes of dimension and detail.

1.5 AUTHORITIES AND AGENCIES

A. Materials, workmanship and installation: Comply with the latest editions of all applicable codes, local ordinances, industry standards, utility company regulations, insurance carrier requirements and these Specifications.

B. Obtain and pay all permits, inspections, licenses for any tapping, connection or initial meter fees and other charges pertaining to the Work. Upon completion of the Work, furnish proof of acceptance by proper agency having jurisdiction.

PART 2 - PRODUCTS

2.1 WATER SERVICE PIPE

A. Ductile Iron Pipe:

1. All ductile iron pipe for water service shall be mechanical joint Class 52 350 PSI pipe conforming to AWWA C-151 and AWWA C-153 for joint. Piping shall include all joint accessories, gasket follower gland and bolts. Fittings shall be furnished with mechanical joint bell on all openings. Use retainer glands on elbow at riser.
2. Retainer glands, and restraint rings shall be Ebaa 'Megalug' type with wedge style design.
3. Mechanical joint tee head bolts, square head bolts and hex nuts shall be all stainless steel type. Install with anti-seize compound to ease installation of fittings.
4. Ductile iron flanges shall be secured to floor/wall with threaded rod that has been securely fastened to concrete floor or wall.
5. Ductile iron shall be used for fire sprinkler riser.
6. A magnesium sacrificial anode will be cad welded to the ductile iron fire riser per detail noted on the drawings. Anode shall be equivalent to Farwest Corrosion Control Company ProMag H-1 Standard Potential, Model 17D3, 17 lb magnesium anode. Anode shall be fabricated per ASTM B843 Industry Standard for AZ63B(H-1A) standard potential anodes. Anode shall be nominal 25" long and have 10 foot of #12 THHN insulated solid core copper lead wire. Anode shall be pre-packaged in cloth bag containing 75% hydrated gypsum, 20% bentonite and 5% silicon Sulfate backfill material to maintain moisture around the anode to reduce earth resistance.

2.2 TRANSITION COUPLINGS

A. Description: Insulating boot to stop electrolytic action between piping of dissimilar metals.

   1. Rating: Minimum 250 psi.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

   1. Power Seal
   2. Ford Meter Box Company
   3. Romac Industries, Inc.

C. Materials:

   1. End and Center Rings: Ductile iron, epoxy or nylon coated inside and out.
   2. Fasteners: Stainless steel.
   3. Boot: EPDM.
   4. Gaskets: SBR.

D. Where pipes of dissimilar metal are joined, ensure dielectric insulation to prevent galvanic corrosion.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that fire water service size, location, and invert elevations.

3.2 PREPARATION AND STORAGE

A. Store pipe on-site on flat surface so barrel is evenly supported. Do not stack higher than six (6) feet. Cover pipe with opaque material for extended storage. Keep ends of stored pipe covered until installation.

B. Remove scale and dirt on inside and outside of pipe, fittings, valves, and appurtenances before assembly. Inspect pipe and other materials for damage before installation.

3.3 BEDDING

A. Hand trim excavation for accurate placement of pipe to elevations indicated.

B. Form and place concrete for pipe thrust restraints at any change of pipe direction, tee, plug, or hydrant. Place 3,000 psi concrete to permit full access to pipe and pipe accessories. Comply with details on Drawings for bends, tees, fire hydrants, and service tap connections.

3.4 INSTALLATION - PIPE, VALVES, AND APPURTENANCES

A. Install all pipe and appurtenances in strict accordance with manufacturer's recommendations and in accordance with AWWA 600 and AWWA C605, as applicable.

B. All foreign material or dirt shall be removed from the inside of the pipe before it is lowered into its position in the trench and it shall be kept clean by approved means during and after laying.

C. Cut pipe in a neat and workmanlike manner without damaging the pipe.

D. All trenches, excavations, and boring pits shall be sheathed and braced, as necessary, so as to provide a safe place for workmen. Comply with all applicable OSHA safety requirements relating to trenching, boring operations, confined spaces, and other aspects of this type of construction.

E. Keep trenches free from surface and ground water until pipe jointing is complete.

F. Form and place concrete for thrust blocking at each bend, tee, change of direction, plug, or hydrant. Thrust blocks shall bear on undisturbed trench wall.

G. When pipe laying is not in progress, the open end(s) of the pipe and fittings shall be plugged. The temporary plug shall be the same size and type used to make a permanent closure to insure a watertight plug and absolute cleanliness inside the pipe.

H. Adjust gate valve and curb stop boxes as shown on Drawings. Set boxes to allow equal movement both above and below finish grade. When in street, set valve boxes ½ inch below finish street grade.

I. Inspection: Do not cover pipe, fittings, valves, couplings, or hydrant barrels until all bedding, joints, and polyethylene wrap have been inspected.

J. Contractor shall be responsible for cleaning and restoring to full operation of property owner’s internal operation (i.e. flow meter, backflow preventer, fire protection, sprinkler line, etc.) if as a result of connecting to existing service lead internal operation is adversely affected.

K. Flange on fire sprinkler line shall be installed level with bolt pattern on flange set so valve stems connected to line can be installed parallel or perpendicular to wall.

L. Fire sprinkler line flanges shall be secured to floor/wall with threaded rod that has been securely fastened to concrete floor or wall.

3.5 PRESSURE TEST

A. Underground Fire Sprinkler Service Piping.

1. All new fire service mains: Hydrostatically tested at 200 PSI for a minimum of 2 hours. If maximum static pressure is 150 PSI or greater, pressure test shall be at 50 PSI greater than maximum static pressure. Tests shall be performed before the joints are covered in order for leaks to be detected.
2. Leakage from new pipe and fittings shall not exceed two quarts/hr per 100 joints or gaskets irrespective of pipe diameter. Leakage for metal seated valves may increase above leakage rate by one fluid ounce per inch valve diameter per hour for each metal seated valve isolating the test section.
3. An operating test shall be performed on all control valves when system is under full pressure to ensure proper operation.
4. Test shall be performed by the Contractor in the presence of the authority having jurisdiction or the representative of the owner. On completion of the test, the Contractor shall complete the "Contractor's" Material & Test Certificate For Underground Piping" contained in NFPA 2 and submit copies to the Owner, Engineer, Local Fire Chief and ISO Commercial Risk Services, Inc.

B. Flushing of Pipe.

1. Underground mains and fire sprinkler service lines to system risers shall be flushed prior to connection to sprinkler piping. Piping shall be flushed for a significant time period to ensure piping has been thoroughly flushed. Minimum flow rate shall not be less than:
    a. Hydraulically calculated water demand rate of system including hose requirements OR
    b. Flow necessary to provide a velocity of 10 ft. per sec. or greater OR
    c. Maximum flow rate available to the system under fire conditions.

END OF SECTION

SECTION 220700 – PLUMBING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes insulating the following plumbing piping services:

1. New domestic water piping.
2. Roof drains and rainwater leaders.

B. Related work in Section 230700 “HVAC Insulation.”

1.2 SUBMITTALS

A. Shop Drawings: For materials covered under this section as per Section 220500.

B. Operation and Maintenance Manual: Per section 220500.

1. Product Data: Each type of insulation.

1.3 QUALITY ASSURANCE

A. All insulation shall be installed in a workmanlike manner by skilled workmen regularly engaged in this type of work.

B. Surface-Burning Characteristics: Refer to Section 230700 “HVAC Insulation”.

PART 2 - PRODUCTS

2.1 INSULATION

A. Refer to Section 230700 “HVAC Insulation”.

PART 3 - EXECUTION

3.1 GENERAL PIPE INSULATION INSTALLATION

A. Refer to Section 230700 “HVAC Insulation”.

3.2 INSTALLATION OF INSULATION

A. Refer to Section 230700 “HVAC Insulation”.

3.3 PIPING INSULATION SCHEDULE, GENERAL

A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.

B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:

1. Drainage piping located in crawl spaces.
2. Underground piping.
3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.4 PIPING INSULATION SCHEDULE

A. Indoor, Aboveground:

1. Domestic Cold, Hot, and Recirculating Hot Water:
    a. 1-1/4” and smaller: Fiberglass, 1” thick.
    b. 1-1/2” and larger: Fiberglass, 1-1/2” thick.
2. Rainleader: Fiberglass insulation, 1” thick.
    a. Metal Piping: Completely insulated
    b. Plastic Piping: 8’ back from each roof drain.
    c. Roof Drain Sumps: 1" premolded or job-fabricated fiberglass. Over insulation, apply 6 ounce canvas neatly pasted in place and apply two coats of sealant over the entire surface.

B. Indoor, Underground:

1. Domestic Cold, Hot, and Recirculating Hot Water:
    a. Polyolefin, 1” thick.
    b. Flexible elastomeric, sealed ends, 1” thick.

END OF SECTION

SECTION 221100 – PLUMBING PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Pipe and fitting materials, and joining methods for the following:
   a. Domestic water distribution piping.
   b. Sanitary waste and vent.
   c. Facility storm drainage.
2. Sacrificial anode for fire riser.

1.2 REFERENCE

A. Refer to Section 230510 "Common Work Results For Piping" for requirements of hangers, sleeves, sleeve seals, and escutcheons.

1.3 SUBMITTALS

A. Refer to Section 232000 "HVAC Piping".

1.4 QUALITY ASSURANCE

A. Potable-water piping and components shall comply with NSF 14 and NSF 61. Plastic piping components shall be marked with "NSF-pw."

B. Non-potable water piping materials shall bear stamp or other markings of testing agency.

PART 2 - PRODUCTS

2.1 COPPER TUBE AND FITTINGS

A. Refer to Section 232000 "HVAC Piping".

2.2 MECHANICAL-JOINT, DUCTILE-IRON PIPE

A. AWWA C151, with mechanical-joint bell and plain spigot end unless grooved or flanged ends are indicated.

B. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.

C. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and stainless steel bolts.

2.3 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

A. Pipe and Fittings: ASTM A 888 or CISPI 301.

B. CISPI, Hubless-Piping Couplings:

1. Standards: ASTM C 1277 and CISPI 310.
2. Description: Stainless-steel corrugated shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.

C. Heavy-Duty, Hubless-Piping Couplings:

1. Standards: ASTM C 1277 and ASTM C 1540.
2. Description: Stainless-steel shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.

2.4 CPVC PIPING

A. CPVC Pipe: ASTM F 441/F 441M, Schedule 40.

1. CPVC Socket Fittings: ASTM F 438 for Schedule 40.

B. CPVC Piping System: ASTM D 2846/D 2846M, SDR 11, pipe and socket fittings.

2.5 PVC PIPE AND FITTINGS

A. Solid-Wall PVC Pipe: ASTM D 2665, drain, waste, and vent.

B. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe.

2.6 PEX TUBE AND FITTINGS

A. PEX Distribution System: ASTM F 877, SDR 9 tubing.

B. Fittings for PEX Tube: ASTM F 1807, metal-insert type with copper or stainless-steel crimp rings and matching PEX tube dimensions.

C. Manifold: Multiple-outlet, corrosion-resistant-metal assembly complying with ASTM F 877; with corrosion-resistant-metal valve for each outlet.

2.7 PIPING JOINING MATERIALS

A. Refer to Section 232000 “HVAC Piping”.

B. Solvent Cements for Joining ABS Piping: ASTM D 2235.

C. Plastic, Pipe-Flange Gaskets, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

D. Joining system for FRP as recommended by manufacturer.

2.8 SACRIFICIAL ANODE

A. Description: Magnesium sacrificial anode for fire riser.

1. Standard: Fabricated per ASTM B843 for AZ63B(H-1A) standard potential anodes.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or prior approved:

1. Farwest Corrosion Control Company.

C. Basis of Design: ProMag H-1 Standard Potential, Model 17D3.

D. Length: 25” long.

E. Accessories:

1. 10 foot of #12 THHN insulated solid core copper lead wire.
2. Anode shall be pre-packaged in cloth bag containing 75% hydrated gypsum, 20% bentonite and 5% silicon Sulfate backfill material to maintain moisture around the anode to reduce earth resistance.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Comply with requirements in Division 31 for excavating, trenching, and backfilling.

3.2 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping.

B. In general, it is intended that piping be installed parallel to building lines, unless otherwise shown on the Drawings, and that equipment be located symmetrical with the architectural elements of the building.

C. Piping shall be fabricated from Contractor's Shop Drawings or field measurements and not from Contract Drawings.

D. Extend plumbing piping to 5 feet from outside face of building wall for connection to building services, including water, fire, waste, and storm piping.

E. This Contractor shall verify all inverts of existing mains and elevations with reference to existing and finish grades. Minimum depth of bury for water lines is 8'0".

F. On water-supply and fire-service lines 4" and larger, install poured concrete thrust blocks at tees, elbows and at base elbow on domestic and fire water service risers in building. Blocks shall be poured against undisturbed earth of trench wall.

G. Rough-in domestic water piping for water-meter installation according to utility company's requirements.

H. Install waste piping 3” and smaller at 1/4” slope, and 4” and larger at 1/8” slope. Vent and storm piping shall be 1/8” slope, unless otherwise noted.

I. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if two fixtures are installed back to back or side by side with common drain pipe. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.

J. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers in sanitary drainage gravity-flow piping. Comply with requirements for cleanouts specified in Section 221300 "Sanitary Waste Piping Specialties."

K. Install piping to permit valve servicing.

L. Install piping free of sags and bends.

M. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.

N. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.

O. Install sleeves for piping penetrations of walls, ceilings, and floors.

P. Install sleeve seals for piping penetrations of below grade concrete walls and slabs.

Q. Install escutcheons (chrome plates) for exposed piping penetrations of finished walls, ceilings, and floors.

3.3 FIRE SERVICE INSTALLATION

A. Flange on fire sprinkler line shall be installed level with bolt pattern on flange set so valve stems connected to line can be installed parallel or perpendicular to wall.

B. Cad weld magnesium sacrificial anode to the ductile iron fire riser per detail noted on the drawings.

C. Install anti-seize compound to ease installation of fittings.

D. Install retainer glans on elbow at riser.

1. Retainer glans and restraint rings shall be Ebaa 'Megalug' type with wedge style design.

3.4 TRANSITION FITTING INSTALLATION

A. Install transition couplings at joints of dissimilar piping.

B. Transition Fittings in Aboveground Domestic Water Piping 2" and Smaller: Plastic-to-metal transition fittings.

3.5 DIELECTRIC FITTING INSTALLATION

A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.

B. Dielectric Fittings for 2" and Smaller: Use dielectric unions.

3.6 FIELD QUALITY CONTROL, ADJUSTING, CLEANING

A. Comply with requirements in Section 220500 "Plumbing General Provisions".

3.7 HANGERS AND SUPPORTS

A. Install the following pipe attachments:

1. Adjustable steel clevis hangers for individual horizontal piping less than 50 feet long.
2. Adjustable roller hangers and spring hangers for individual horizontal piping 50 feet or longer.
3. Install trapeze hanger for multiple parallel piping 50 feet or longer.
4. Spring hangers to support vertical runs.
5. Provide copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.
6. On plastic pipe, install pads or cushions on bearing surfaces to prevent hanger from scratching pipe.
7. Install hanger 12" from elbow joint.

B. Install hangers for steel piping as follows:

1. 1" and smaller: 8 feet with 3/8-inch rod.
2. 1-1/4" to 3": 10 feet with 3/8-inch rod.
3. 4" to 6": 12 feet with 1/2-inch rod.
4. 8" and larger: 12 feet with 5/8-inch rod.

C. Install hangers for drawn-temper copper piping as follows:

1. 1-1/2" and smaller: 6 feet with 3/8-inch rod.
2. 2" to 4": 10 feet with 3/8-inch rod.
3. 6" and larger: 10 feet with 1/2-inch rod.

D. Install hangers for CPVC and PVC as follows:

1. 1" and smaller: 3 feet with 3/8-inch rod; 8 feet with pipe support channel and 3/8" rod.
2. 1-1/4" to 3": 4 feet with 3/8-inch rod; 8 feet with pipe support channel and 3/8" rod.
3. 4" to 6": 4 feet with 1/2-inch rod; 10 feet with pipe support channel and 1/2" rod.
4. 8" and larger: 4 feet with 5/8-inch rod; 10 feet with pipe support channel and 5/8" rod.

E. PEX:

1. 1” and Smaller: 3 feet with 3/8-inch rod; 8 feet with pipe support channel and 3/8” rod.

F. Support vertical runs at roof, at each floor, and at 10-foot intervals between floors.

G. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.

3.8 PIPING SCHEDULE

A. Do not use flanges or unions for underground water supply piping.

B. Fitting Option: Extruded-tee connections and brazed joints may be used on aboveground copper tubing.

C. Piping materials are identified below. If more than one material is listed for an application, selection from materials listed is Contractor's option.

D. Underground water-service piping 4” and 6”:

1. Soft copper tube, Type K, Type L; wrought-copper, solder-joint fittings; and brazed joints.
2. Ductile-iron, mechanical-joint pipe; ductile-iron, mechanical-joint fittings; and mechanical joints.
3. PVC, AWWA Class 150 pipe; PVC, AWWA Class 150 molded fittings; and gasketed joints.

E. Aboveground water-service piping 4” and 6”:

1. Hard copper tube, Type K, Type L; wrought-copper, solder-joint fittings; and brazed joints.
2. Ductile-iron, grooved-end pipe; ductile-iron, grooved-end appurtenances; and grooved joints.

F. Under-building-slab, domestic water, building-service piping:

1. 3” and smaller: HDPE; heat fused fittings in accordance with pipe manufacturer’s procedures.
2. 3” and larger: Bell and spigot, ductile-iron pipe.

G. Under-building-slab, domestic water piping:

1. 1” and smaller: PEX tube; Soft copper tube, Type K, Type L; no joints.
2. 3” and smaller: HDPE; heat fused fittings in accordance with pipe manufacturer’s procedures.

H. Aboveground domestic water piping:

1. All sizes: Hard copper tube, Type L or Type M; cast- or wrought-copper, solder-joint fittings; and soldered joints.
2. 1” and smaller: PEX tube; fittings for PEX tube; and crimped joints.
3. 2-1/2” and larger: Hard copper tube, Type L or Type M; grooved-joint, copper-tube appurtenances; and grooved joints.
4. 4” and smaller: Hard copper tube, Type L or Type M; copper pressure-seal-joint fittings; and pressure-sealed joints.
5. 4” and smaller: CPVC, Schedule 40 socket fittings; and solvent-cemented joints.

I. Underground Fire-Service-Main Piping 4” to 8”:

1. Ductile-iron, mechanical-joint pipe; ductile-iron, mechanical-joint fittings; and mechanical joints.
2. Beyond 5 feet from outside face of building wall: PVC, AWWA Class 200 pipe listed for fire-protection service; PVC Class 200 fabricated fittings; and gasketed joints.

J. Aboveground Fire-Service-Main Piping 4” to 8”: Ductile-iron, grooved-end pipe; ductile-iron-pipe appurtenances; and grooved joints.

K. Change of direction fittings for vent, soil, and waste pipe:

1. Soil and waste piping: Long-sweep bends.
2. Vertical stacks change of direction from horizontal to vertical: Sanitary tees and short-sweep 1/4 bends acceptable.
3. Back to back or side by side fixtures with common drain pipe: Long turn, double Y-branch and 1/8-bend fittings.

L. Aboveground, vent, soil, and waste piping:

1. Hubless, cast-iron soil pipe and fittings; heavy-duty hubless-piping couplings; and coupled joints.
2. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
    a. Exception: PVC shall not be used for 20 feet from waste receptacle where waste stream is 140°F or greater, such as from commercial dishwashers.
    b. Exception: PVC shall not be used in return air plenum spaces.
3. Dissimilar Pipe-Material Couplings: Unshielded, non-pressure transition couplings.
4. Additional option for piping 4” and smaller: Copper DWV tube, copper drainage fittings, and soldered joints.

M. Underground, vent, soil, and waste piping:

1. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
    a. Exception: PVC shall not be used for 20 feet from waste receptacle where waste stream may exceed 140 °F, such as from commercial dishwashers.
2. Additional option for piping 4” and smaller: Solid-wall ABS pipe, ABS socket fittings, and solvent-cemented joints.
3. Dissimilar Pipe-Material Couplings: Unshielded, non-pressure transition couplings.

N. Aboveground storm drainage piping:

1. Hubless, cast-iron soil pipe and fittings; heavy-duty, hubless-piping couplings; and coupled joints.
2. Copper DWV tube, copper drainage fittings, and soldered joints.
3. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
    a. Exception: PVC shall not be used in return air plenum spaces.
4. Dissimilar Pipe-Material Couplings: Unshielded, non-pressure transition couplings.

O. Underground storm drainage piping:

1. 6” and smaller: Solid-wall ABS pipe, ABS socket fittings, and solvent-cemented joints.
2. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
3. Dissimilar Pipe-Material Couplings: Unshielded, non-pressure transition couplings.

END OF SECTION

SECTION 221200 – PLUMBING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Flowmeters.
2. Water tempering valves.
3. Drain valves.
4. Water-hammer arresters.
5. Trap-seal primer valves.
6. Compression outlet connection outlet box.

1.2 SUBMITTALS

A. Shop Drawings: For equipment covered under this section as per Section 220500.

B. Operation and Maintenance Manuals: For equipment covered under this section as per Section 220500.

1.3 QUALITY ASSURANCE

A. Comply with NSF 61, "Drinking Water System Components - Health Effects," for potable-water storage tanks. Include appropriate NSF marking.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig minimum unless otherwise indicated.

B. For products where a list of pre-approved manufacturers is not provided, the submitted product must be equivalent to the indicated basis of design.

2.2 FLOWMETERS

A. Description: Inline spring and piston type flowmeter.

1. Basis of Design: Omega Easy-view Flowmeter, model FL-9000.
2. Material: Clear polysulfone, T300 series stainless steel spring, Buna flow indicator ring, Buna O-rings (on units with brass end fittings).
3. Ratings: 250°F, 325 psig.

2.3 WATER TEMPERING VALVES

A. Description: Water-temperature limiting devices for public lavatories:

1. Basis of Design: Watts Regulator Co. LFUSG-B, LFMMV.
2. Standard: ASSE 1070.
3. Type: Thermostatically controlled, water mixing valve.
4. Material: Bronze body with corrosion-resistant interior components.
5. Wetted surface shall be less than 0.25% of lead by weight.
6. Cross Flow Protection: Integral check valves and integral screens.
7. Minimum Flow: 0.5 gpm.
8. Tempered-Water Setting: 110°F.

2.4 HOSE BIBBS

A. Hose Bibbs:

1. Basis of Design: Watts Regulator Co. SC8.
2. Body Material: Bronze.
3. Seat: Bronze, replaceable.
4. Outlet Connection: Garden-hose thread.
5. Vacuum Breaker: Nonremovable, drainable, hose-connection vacuum breaker complying with ASSE 1011.
6. Equipment Rooms: Rough bronze finish, wheel handle operation.
7. Finish for Service Areas: Rough bronze finish, wheel handle operation.
8. Finish for Finished Rooms: Chrome or nickel plated finish, wheel handle operation.
9. Include operating key with each operating-key hose bibb.
10. Include integral wall flange with each chrome- or nickel-plated hose bibb.
11. Include backflow preventer for hose bibbs connected to chemical dispensers.

2.5 DRAIN VALVES

A. Ball-Valve-Type, Hose-End Drain Valves:

1. Equivalent to Watts Regulator Co. Series BD-QT.
2. Pressure Rating: 150-psig minimum CWP.
3. Size: 3/4”.
4. Body: Forged Brass.
5. Ball: Chrome-plated brass.
6. Stem Packing: Teflon.
7. Handle: Aluminum or Vinyl-covered steel.
8. Outlet: Threaded, short nipple with garden-hose thread and cap with brass chain.

2.6 WATER-HAMMER ARRESTERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. AMTROL, Inc.
2. Josam Company.
3. Sioux Chief Manufacturing Company, Inc.
4. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
5. Tyler Pipe; Wade Div.
6. Watts Drainage Products.
7. Zurn Industries, LLC; Plumbing Products Group; Specification Drainage Products.

B. Water-Hammer Arresters: Comply with ASSE 1010 or PDI-WH 201.

1. Type: Copper tube with piston.
2. Size: ASSE 1010, Sizes AA and A through F, or PDI-WH 201, Sizes A through F.

2.7 TRAP-SEAL PRIMER DEVICE - PNEUMATIC

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Precision Plumbing Products, Inc.
2. Sioux Chief Manufacturing Company, Inc.
3. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
4. Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.

B. Basis of Design: Precision Plumbing Products model PR-500.

C. Supply-Type, Trap-Seal Primer Device: Comply with ASSE 1018, bronze body with rough bronze finish.

2.8 COMPRESSION OUTLET CONNECTION OUTLET BOX

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. IPS Corporation.
2. Precision Plumbing Products.
3. Sioux Chief Manufacturing Company, Inc.
4. Oatey; MODA.

B. Description: Ice maker outlet box with supply connections, valves, and water hammer arrester.

C. Outlet Box:

1. Box: Single, Plastic.
   a. Provide 2-hour fire rated box for installation in rated walls.
2. Arresters: ASSE 1010, piston type.
3. Mounting Brackets: Metal.
4. Valves: Brass, quarter turn.
5. Supply Outlet Connection: 1/4” compression.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install water temperature-limiting devices on all public lavatories.

B. Install water hammer arresters in piping branches with fast-closing valves, such as flush valves. Locate upstream of last fixture in pipe branch.

C. Install supply-type, trap-seal primer valves with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.

D. Connect water piping to water heaters and storage tanks with unions or flanges and with shutoff valves. Connect tank drains with shutoff valves and discharge over closest floor drains.

E. Drain Valves: 3/4” ball valve. Include outlet with, or nipple in outlet with, ASME B1.20.7, 3/4-11.5NH thread for garden-hose service, threaded cap, and chain.

END OF SECTION

SECTION 221300 – SANITARY WASTE SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following sanitary drainage piping specialties:

1. Cleanouts.
2. Floor drains.
3. Floor drain trap seals.
4. Flashing materials.

1.2 SUBMITTALS

A. Shop Drawings: For equipment covered under this section as per Section 220500.

B. Operation and Maintenance Data: For equipment covered in this section as per Section 220500.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Except in other Part 2 articles where noted, the following manufacturers are acceptable

1. Josam Company; Josam Div.
2. MIFAB, Inc.
3. Sioux Chief Manufacturing Company.
4. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
5. Tyler Pipe; Wade Div.
6. Watts Drainage Products Inc.
7. Zurn Plumbing Products Group; Specification Drainage Operation.

B. All manufacturers are subject to compliance with requirements

C. Provide products by one of the manufacturers specified or by prior approval.

2.2 CLEANOUTS

A. Standard: ASME A112.36.2M.

B. Cleanouts – Exposed:

1. Body Material: As required to match connected piping.
2. Size: Same as connected drain line as indicated on drawings.
3. Closure: Countersunk or raised-head threaded plug.
4. Closure Plug Size: Same as or not more than one size smaller than cleanout size.

C. Cleanout –Floor:

1. Basis of Design: Wade 6000 Series.
2. Cover – Finished Floor: Nickel bronze; scoriated; “C.O.” cast into cover.
3. Cover – Unfinished Floor: Cast iron; “C.O.” cast into cover.
4. Cover – Carpeted Floor: Same as finished floor cover with carpet clamping flange.
5. Cover Shape: Round, except where noted otherwise on drawings.
6. Type: Adjustable housing.
7. Size: Same as connected drain line as indicated on drawings.
8. Closure: Brass plug.

9. Body or Ferrule: Cast iron in areas subjected to wheel traffic; Plastic permitted light duty areas.
10. Top Loading Classification: Heavy duty in areas subjected to wheel traffic; Light duty otherwise.
11. Riser: Long radius bends.

D. Cleanouts – Wall:

1. Body: Soil pipe test tee, material as required to match connected piping.
2. Size: Same as connected drain line as indicated on drawings.
3. Closure: Raised-head, threaded plug.
4. Closure Plug Size: Same as or not more than one size smaller than cleanout size.
5. Wall Access: Round, flat, chrome-plated brass or stainless-steel cover plate with screw.

2.3 FLOOR DRAINS

A. Floor Drains:

1. Basis of Design: Watts FD-100
2. Standard: ASME A112.6.3.
3. Pattern: Floor drain. Provide funnels where shown on drawings.
4. Body: Cast iron; provide seepage flange and clamping device.
5. Size: Same as connected drain line as indicated on drawings.
6. Strainer: Nickel bronze; adjustable; round, except as otherwise indicated on drawings.
7. Raised Flange: Provide for drains in mechanical rooms.
8. Loading Classification: Heavy duty in areas subjected to wheel traffic; Light duty otherwise.
9. Trap Features: Cleanout and trap-seal primer valve drain connection where shown on drawings.

B. General Requirements for Above Grade Drain Bodies:

1. Flashing Materials: Required.
2. Exception: Shower drains where flashing materials are furnished and installed by the General Contractor.
3. Dimensions: Minimum of 8" wider in all directions from drain body.

2.4 FLOOR DRAIN TRAP SEAL

A. Description: Inline floor drain seal with rubber sealing flapper to seal drain opening from sewer gasses and opens to allow water flow.

1. Standard: ASSE 1072.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Green Drain Inc.
2. Jay R. Smith Mfg. Co.
3. MIFAB.

C. Basis of Design: MIFAB MI-GARD Series inline floor drain trap seal.

D. Materials:

1. Frame: UV resistant ABS plastic.
2. Flapper: Silicon rubber, air-tight sealing.

2.5 FLASHING MATERIALS

A. Lead Sheet: ASTM B 749, Type L51121, copper bearing, with the following minimum weights and thicknesses, unless otherwise indicated:

1. General Use: 4.0-lb/sq. ft., 0.0625-inch thickness.
2. Vent Pipe Flashing: 3.0-lb/sq. ft., 0.0469-inch thickness.
3. Burning: 6-lb/sq. ft., 0.0938-inch thickness.

B. Sheet Membrane: Non-plasticized Chlorinated Polyethylene (CPE) conforming to ANSI A118.10.

1. General Use: 0.040-inch thickness.

C. Fasteners: Metal compatible with material and substrate being fastened.

D. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation; matching or compatible with material being installed.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION

A. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:

1. Size same as drainage piping up to 4". Use 4" CO for drainage piping up to 6" in size. Use 6" CO in larger drainage piping unless larger cleanout is indicated.
2. Locate at each aggregate change in direction of piping greater than 135 degrees.
3. Locate at minimum intervals of 75.
4. Locate at base of each vertical soil and waste stack.

B. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.

C. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.

D. Set grates of floor drains flush with finished floor, unless otherwise indicated.

1. Size same as drainage piping.
2. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.

E. Install roof flashing assemblies on sanitary stack vents and vent stacks that extend through roof.

F. Install flashing fittings on sanitary stack vents and vent stacks that extend through roof.

3.2 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

END OF SECTION

SECTION 221400 – STORM DRAINAGE SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Roof Drains
2. Downspouts

1.2 REFERENCE

A. Refer to 221300 “Sanitary Waste Specialties” for Cleanouts.

1.3 SUBMITTALS

A. Shop Drawings: For equipment covered under this section as per Section 220500.

B. Operation and Maintenance Data: For equipment covered in this section as per Section 220500.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Except in other Part 2 articles where noted, the following manufacturers are acceptable:

1. Josam Company; Josam Div.
2. MIFAB, Inc.
3. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
4. Tyler Pipe; Wade Div.
5. Watts Drainage Products Inc.
6. Zurn Plumbing Products Group; Specification Drainage Operation.

B. All manufacturers are subject to compliance with requirements

C. Provide products by one of the manufacturers specified or by prior approval.

2.2 ROOF DRAINS

A. General-Purpose Roof Drains, Domed:

1. Standard: ASME A112.6.4, for general-purpose roof drains.
2. Body Material: Epoxy coated cast iron.
3. Dimension of Large-Sump Body: Nominal 20-inch diameter.
4. Dimension of Standard-Sump Body: Nominal 12-inch diameter.
5. Dimension of Small-Sump Body: Nominal 8-inch diameter.
6. Roof Sump Receiver: Required.
7. Outlet: Bottom.
8. Adjustable Collars: Required.
9. Underdeck Clamp: Required.
10. Dome Material: Aluminum or Cast iron.
11. Perforated Gravel Guard: Not required.
12. Vandal-Proof Dome: Not required.
13. Water Dam: 2 inches high on overflow roof drains only (RD-2).

2.3 MISCELLANEOUS STORM DRAINAGE PIPING SPECIALTIES

A. Downspout Nozzles:

1. Basis of Design: Zurn model Z199.
2. Description: Bronze body with threaded inlet and bronze wall flange with mounting holes.
3. Size: Same as connected conductor.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install roof drains at low points of roof areas according to roof membrane manufacturer's written installation instructions.

1. Install flashing collar or flange of roof drain to prevent leakage between drain and adjoining roofing. Maintain integrity of waterproof membranes where penetrated.
2. Install expansion joints, if indicated, in roof drain outlets.
3. Position roof drains for easy access and maintenance.

B. Install downspout nozzles to discharge at 12” above grade.

3.2 ROOF DRAIN SCHEDULE

A. Domed Roof Drains: Limited access roofs.

1. Small-Sump Body: 4” conductor size and smaller.
2. Standard-Sump Body: 8” conductor size and smaller.
3. Large-Sump Body: 10” up to 16” conductor size.

B. Promenade Roof Drains: Sun deck style roof, accessible to non-service personal.

3.3 FLASHING INSTALLATION

A. Fabricate flashing from single piece of metal unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:

1. Lead Sheets: Burn joints of 6.0-lb/sq. ft. lead sheets, 0.0938-inch thickness or thicker. Solder joints of 4.0-lb/sq. ft. lead sheets, 0.0625-inch thickness or thinner.
2. Copper Sheets: Solder joints of copper sheets.

B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.

1. Pipe Flashing: Sleeve type, matching the pipe size, with a minimum length of 10 inches and with skirt or flange extending at least 8 inches around pipe.
2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches around sleeve.
3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches around specialty.

C. Set flashing on roofs in solid coating of bituminous cement.

D. Secure flashing into sleeve and specialty clamping ring or device.

E. Fabricate and install flashing and pans, sumps, and other drainage shapes.

3.4 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

END OF SECTION

SECTION 223000 – PLUMBING EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Water heaters.
2. Domestic hot water circulation pumps (Recirculation pumps).
3. Sump pumps.

1.2 SUBMITTALS

A. Shop Drawings: For equipment covered under this section as per Section 220500.

B. Operation and Maintenance Data: For equipment covered in this section as per Section 220500.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended use.

B. UL Compliance: Comply with UL 778 for motor-operated water pumps.

1.4 WARRANTY

A. Manufacturer's standard form in which manufacturer agrees to repair or replace components that fail in materials or workmanship within specified period.

1. Warranty Period: Not less than one year from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 WATER HEATERS, STORAGE TYPE

A. Description: Residential electric water heater with steel tank.

1. Standard: UL 174 for Household Electric Water Heaters.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Bradford White Corporation.
2. Rheem Manufacturing Company.
3. Smith, A. O. Water Products Co.; a division of A. O. Smith Corporation.
4. State Water Heaters
5. Lochinvar

C. Storage-Tank Construction: Steel, vertical arrangement.

1. Pressure Rating: 150 psig.
2. Interior Finish: Glass coated to comply with NSF 61 barrier materials for potable-water tank linings.

D. Factory-Installed Storage-Tank Appurtenances:

1. Dip Tube: Non metalic.
2. Brass Drain Valve: Required.
3. Insulation: Polyurethane foam.

4. Jacket: Steel, painted.
5. Heating Elements: Two; electric, screw-in immersion type; wired for simultaneous operation unless otherwise indicated.
6. Temperature Control: Adjustable thermostat.
7. Relief Valve: Combination temperature-and-pressure relief valves.

2.2 WATER HEATER ACCESSORIES

A. Piping-Type Heat Traps: Field-fabricated piping arrangement according to ASHRAE/IESNA 90.1.

B. Drain Pan: Water heater on second floor shall be set in drain pan with drain pipe to adjacent floor drain.

2.3 CIRCULATOR PUMPS, WET ROTOR

A. Description: Factory-assembled and -tested, wet rotor, seal less, self-lubricating, cartridge pump designed for installation with pump mounted horizontally or vertically.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Armstrong Pumps Inc
2. Bell & Gossett; Div. of ITT Industries
3. Grundfos Pumps Corp.
4. Taco Comfort Solutions.
5. Thrush Company Inc.
6. Wilo USA LLC

C. Pump Construction:

1. Casing: Bronze with NPT, union, or flanged connections.
2. Impeller: Non-metallic.
3. Pump Shaft: Ceramic.
4. Pump Bearings: Carbon.

D. Motor: Single or multi-speed stainless steel replaceable cartridge design.

E. Accessories:

1. Timers: Electric; adjustable for control of hot-water circulation (recirc) pump.
   a. Type: Programmable, 24 hour clock with manual override on-off switch.
   b. Operation of Pump: On or off.
   c. Programmable Sequence of Operation: Minimum of one on-off cycles each day.
   d. Aquastat – Clamp on aquastat to turn pump off when pipe temperature reaches 120 degrees and turns pump on at 100 degrees.
2. Electrical: 120/1/60; Pre-wired power cord, 6’ in length acceptable to power both control devices, coordinate with E.C. if provided.

2.4 SUBMERSIBLE SUMP PUMPS

A. Description: Submersible, fixed-position, single-seal sump pumps; factory-assembled and -tested sump-pump unit.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Bell & Gossett Domestic Pump; ITT Corporation.
2. Goulds Pumps; ITT Corporation.
3. Grundfos Pumps Corp.

4. Pentair Pump Group; Hydromatic Pumps.
5. Little Giant Pump Co.
6. Weil Pump Company, Inc.
7. Zoeller Company.

C. Pump Type: Submersible, end-suction, single-stage, close-coupled, overhung-impeller, centrifugal sump pump.

D. Pump Construction:

1. Pump Casing: Cast iron, with strainer inlet, legs that elevate pump to permit flow into impeller, and vertical discharge for piping connection.
2. Impeller: Statically and dynamically balanced, cast iron or bronze design for clear wastewater handling, and keyed and secured to shaft.
3. Pump and Motor Shaft: Stainless steel or steel, with factory-sealed, grease-lubricated ball bearings.
4. Seal: Mechanical.

E. Motor: Hermetically sealed, capacitor-start type; with built-in overload protection; lifting eye or lug; and three-conductor, waterproof power cable of length required and with grounding plug and cable-sealing assembly for connection at pump.

F. Pump Control:

1. Single “piggyback” variable level float switch with 20 foot cord.

G. Alarm Controls (Not required for SP-1):

1. Enclosure: NEMA 1.
2. Horn, 9 volt backup battery, auto reset, 6 foot power cord.
3. Switch: 15 foot alarm tethered float switch.
4. Auxiliary dry contact for BAS alarm status.

H. Control-Interface Features (Not required for SP-1):

1. Remote Alarm Contacts: For remote alarm interface.
2. Building Automation System Interface: Auxiliary contacts in pump controls for interface to building automation system and capable of providing the following:
   a. On-off status of pump.
   b. Alarm status.

2.5 SUMP-PUMP BASINS AND BASIN COVERS, SP-1 FIRE PROTECTION DRAINAGE

A. Basins: Factory-fabricated, watertight, cylindrical, basin sump with top flange and sidewall openings for pipe connections. Size as scheduled on drawings.

1. Material: Polyethylene or fiberglass.
2. Polyethylene Wall Thickness: Basin size 24”x30” or less: 0.20”; Basin size 36”x36” or less: 0.230”.
3. Fiberglass Wall Thickness: Basin size 36”x36” or less: 0.188”; Basin size 48”x48”: 0.250”.
4. Anchor Flange: Same material as or compatible with basin sump, cast in or attached to sump, in location and of size required to anchor basin in concrete slab.

B. Basin Covers: Fabricate epoxy steel cover with two 3” openings, one for discharge piping and the other for vent, fire protection system drainage pipe and power cable.

1. Reinforcement: Cover, capable of supporting foot traffic.

2.6 SUMP-PUMP BASINS AND BASIN COVERS, SP-2 NEW ELEVATOR

A. Basins: Factory-fabricated, watertight, cylindrical, basin sump with top flange and sidewall openings for pipe connections. Size as scheduled on drawings.

1. Material: Polyethylene or fiberglass.
2. Polyethylene Wall Thickness: Basin size 24”x30” or less: 0.20”; Basin size 36”x36” or less: 0.230”.
3. Fiberglass Wall Thickness: Basin size 36”x36” or less: 0.188”; Basin size 48”x48”: 0.250”.
4. Anchor Flange: Same material as or compatible with basin sump, cast in or attached to sump, in location and of size required to anchor basin in concrete slab.

B. Basin Covers: Fabricate metal cover with 3” openings for penetration of discharge piping and 1 ½” opening for power cables. Cover to be perforated with ½” diameter openings, 10 minimum.

1. Reinforcement: Steel or cast iron, capable of supporting foot traffic.

2.7 SUMP-PUMP BASINS AND BASIN COVERS, SP-3 PIT SUBSOIL DRAINAGE

A. Basins: Factory-fabricated, watertight, cylindrical, basin sump with top flange and sidewall openings for pipe connections. Size as scheduled on drawings.

1. Material: Polyethylene or fiberglass.
2. Polyethylene Wall Thickness: Basin size 24”x30” or less: 0.20”; Basin size 36”x36” or less: 0.230”.
3. Fiberglass Wall Thickness: Basin size 36”x36” or less: 0.188”; Basin size 48”x48”: 0.250”.
4. Anchor Flange: Same material as or compatible with basin sump, cast in or attached to sump, in location and of size required to anchor basin in concrete slab.

B. Basin Covers: Fabricate metal cover with openings having gaskets, seals, and bushings; for access to pumps, pump shafts, control rods, discharge piping, vent connections, and power cables.

1. Reinforcement: Steel or cast iron, capable of supporting foot traffic.

PART 3 - EXECUTION

3.1 DOMESTIC-WATER HEATER INSTALLATION

A. Water Heater Mounting: Install commercial, electric, domestic-water heaters on concrete base.

1. Exception: Omit concrete bases for commercial, electric, domestic-water heaters if installation on stand, bracket, suspended platform, or directly on floor is indicated.

B. Residential, Water Heater Mounting: Install residential, water heaters on floor, or on water-heater stand on floor if required to be elevated 18”.

C. Install water heaters level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances.

1. Install shutoff valves on water-supply piping to water heaters and on hot-water outlet piping.

D. Install gas-fired, domestic-water heaters according to NFPA 54.

1. Install gas shutoff valves on gas supply piping to gas-fired water heaters.

E. Install combination temperature-and-pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend water-heater relief-valve outlet, with drain piping same as domestic-water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.

F. Install condensate drain piping same as domestic-water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.

G. Install combination temperature-and-pressure relief valves in water piping for water heaters without storage. Extend water-heater relief-valve outlet, with drain piping same as domestic-water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.

H. Install thermometers on outlet piping of commercial water heaters.

I. Install pressure-reducing valve with integral bypass relief valve in electric, domestic-water booster-heater inlet piping and water hammer arrester in booster-heater outlet piping. Set pressure-reducing valve for outlet pressure of 25 psig.

J. Install piping-type heat traps on inlet and outlet piping of electric, domestic-water heater storage tanks without integral or fitting-type heat traps.

3.2 INSTALLATION OF HOT WATER RECIRCULATION PUMPS

A. Install thermostats in hot-water return piping.

B. Install timers in accessible location on wall near hot water heater.

C. Adjust domestic water pumps to function smoothly and lubricate as recommended by manufacturer.

D. Adjust initial temperature set points.

3.3 CLEANING

A. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed, use procedure described in section 220500 “Plumbing General Provisions.”

END OF SECTION

SECTION 224000 – PLUMBING FIXTURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Water closets.
2. Toilet seats.
3. Urinals
4. Flush valves.
5. Lavatories.
6. Lavatory faucets.
7. Sinks.
8. Mop service basins.
9. Wall faucets.
10. Electric water coolers.
11. Shower Assembly.
12. Supply fittings.
13. Protective shielding pipe covers.

B. See Drawings for basis of design manufacturers and models.

1.2 SUBMITTALS

A. Shop Drawings: For equipment covered under this section as per Section 220500.

B. Operation and Maintenance Data: For equipment covered in this section as per Section 220500.

1.3 QUALITY ASSURANCE

A. NSF Standard: Comply with NSF 61, "Drinking Water System Components - Health Effects," for fixture materials that will be in contact with potable water.

B. Regulatory Requirements: Comply with requirements in ICC/ANSI A117.1, "Accessible and Usable Buildings and Facilities for plumbing fixtures for people with disabilities.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Except in other Part 2 articles where noted, the following manufacturers are acceptable:

1. Water closet, urinal, lavatory, clinic service sinks:
   a. American Standard America.
   b. Crane Plumbing.
   c. Kohler Co.
   d. Mansfield Plumbing.
   e. Sloan Valve Company.
   f. Toto USA, Inc.
   g. Zurn Industries, LLC; Commercial Brass and Fixtures.
2. Flushometer valves:
   a. American Standard.
   b. Delany Products.
   c. Delta Faucet Company.

d. Sloan Valve Company.
e. Zurn Industries, LLC; Commercial Brass and Fixtures.

3. Toilet seats:
   a. Bemis Manufacturing Company.
   b. Centoco Manufacturing Corporation.
   c. Church Seats.
   d. Kohler Co.
   e. Zurn Industries, LLC; Commercial Brass and Fixtures.

4. Brassware (faucets):
   a. American Standard.
   b. Cambridge Brass, Inc.
   c. Chicago Faucets.
   d. Component Hardware Group, Inc.
   e. Delta Faucet Company.
   f. Elkay Manufacturing Co.
   g. Grohe America, Inc.
   h. Just Manufacturing.
   i. Kohler Co.
   j. Moen Incorporated.
   k. Sloan Valve Company.
   l. T & S Brass and Bronze Works, Inc.
   m. Zurn Industries, LLC; Commercial Brass and Fixtures.

5. Sinks:
   a. Elkay Manufacturing Co.
   b. Just Manufacturing.
   c. Franke Kindred Canada.

6. Mop Service Basin, Laundry/Utility Tub:
   a. Ferguson Enterprises, Inc.; ProFlo Brand.
   b. Fiat Products.
   c. Florestone Products Co., Inc.
   d. Mustee, E. L., & Sons, Inc.
   e. Swan Corporation (The).
   f. Zurn Industries, LLC; Light Commercial Specialty Plumbing Products.

7. Water Coolers:
   a. Elkay Manufacturing Co.
   b. Halsey Taylor.
   c. Haws Corporation.
   d. Oasis International.
   e. Tri Palm International, LLC; Oasis Brand.

8. Showers Valves and Heads:
   a. American Standard America
   b. Delta
   c. Kohler
   d. Moen
   e. Symmons

9. Carriers:
   a. Jay R. Smith MFG. Co., Inc.
   b. Josam Company.
   c. Wade Specification Drainage Products.

d. Watts Water Technologies.
e. Zurn Industries, LLC.

B. All manufacturers are subject to compliance with requirements.

C. Provide products by one of the manufacturers specified or by prior approval.

2.2 WATER CLOSETS – WALL-MOUNTED

A. Water Closets: Wall mounted, flush valve, exposed top spud.

1. ADA Water Closets: Comply with ICC/ANSI A117.1

B. Bowl:

1. Material: Vitreous china, white, conforming to ASME A112.19.2/CSA B45.1.
2. Bowl Type: Siphon jet.
3. Rim Contour: Elongated.
4. Spud Location: Top.

C. Toilet Seat: Required.

D. Support Carrier: Waste-fitting assembly, as required to match drainage piping material and arrangement with faceplates, couplings gaskets, and feet; bolts and hardware matching fixture.

2.3 TOILET SEATS

A. Provide on all water closets:

1. Standard: IAPMO/ANSI Z124.5.
2. Material: Plastic, white.
3. Type: Commercial (Standard).
4. Shape: Elongated rim, open front.
5. Hinge: Check, non-corroding metal.
6. Seat Cover: Not required.

2.4 URINALS – WALL-HUNG

A. Urinals: Wall hung.

1. ADA Mounting Height: Complying with ICC/ANSI A117.1

B. Fixture:

1. Material: Vitreous china, white, conforming to ASME A112.19.2/CSA B45.1.
2. Type: Siphon jet, blowout or washdown.
3. Strainer or Trapway: Manufacturer's standard strainer with integral trap.
4. Spud Location: Top .
5. Outlet Location: Back.

C. Support Carrier: Urinal carrier with fixture support plates and coupling with seal and fixture bolts and hardware matching fixture equivalent to Wade W-400 series.

2.5 FLUSH VALVES – AUTOMATIC

A. Description: Battery powered, diaphragm or piston flushometer valves.

1. Pressure Rating: 125 psig.
2. Standard: ASSE 1037.

B. Features: Integral stop, backflow-prevention device, flush override button, and adjustable range.

1. Body Material: Brass with corrosion-resistant components.
2. Diaphragm Material: Chloramine resistant.
3. Stop Cap: Vandal resistant.
4. Actuator: Solenoid, Battery-powered, electronic sensor.
5. Finish: Chrome plated.

2.6 LAVATORIES (COUNTERS)

A. Description: Integral bowls in solid surface countertop, ADA compliant.

B. Accessories: Supplies, p-trap.

1. Supplies: 3/8" angle with stops.
2. P-trap: 1-1/4", pvc or pp.

2.7 LAVATORIES – WALL-MOUNTED

A. Description: Vitreous china, wall mounted, with back; ADA compliant.

1. Material: Vitreous china, white, conforming to ASME A112.19.2/CSA B45.1.
2. Faucet-Hole Location: Top.
3. Soap Dispenser Hole: None.
4. Overflow: Required.
5. Mounting: Concealed-arm chair carrier.
6. ADA Standard: Comply with ICC/ANSI A117.1

B. Accessories: Supplies, p-trap, support.

1. Supplies: 3/8" angle with stops.
2. P-trap: 1-1/4", pvc or pp.
3. Support for 2x4 stud wall: Carrier equivalent to Wade 404 series.

2.8 LAVATORY FAUCETS – MANUAL PEDESTAL

A. Description: Manual, single-handle mixing, commercial general-duty, solid-brass valve.

1. Standard: ASME A112.18.1/CSA B125.1.
2. General: Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture hole punching.
3. Body Material: Solid brass.
   a. Finish: Polished chrome plate.
4. Spout: Fixed.
5. Spout Outlet: Vandal resistant aerator.
6. Lavatory Outlet: Grid strainer with offset tailpiece equivalent to Kohler K-7131.

2.9 SINKS – S-2 DOUBLE COMPARTMENT

A. Description: Counter mounted, back ledge.

1. Standard: ASME A112.19.3/CSA B45.4.
2. Material: 18 gauge, type 302 stainless steel.
3. Each Drain: Grid with 1-1/2" tailpiece and p-trap; removable conical basket strainer with metal stem and rubber stopper, equivalent to Elkay model LK35.
4. Drain Location: Centered in compartment.
5. ADA Compliant Bowl Depth: 6 inches.
6. Mounting: On counter with sealant.

B. Faucets: Manual-type. single-control mixing valve, gooseneck with pull-down spray.

1. Basis of Design: Delta 9182-AR-PR-DST.
2. Standard: ASME A112.18.1/CSA B125.1.
3. General: Single-control mixing valve, 9 3/8” reach gooseneck with pull-down spray.
4. Finish: Artic Stainless.
5. Number Required: One.
6. Faucet Mounting: On ledge.
7. Mounting Type: Deck, exposed.
8. Valve Handle(s), Spout: Per Drawing schedules.
    a. Spout Outlet: Aerated stream or spray.

2.10 SINKS – S-1 SMALL SINKS

A. Description: Counter mounted, back ledge.

1. Standard: ASME A112.19.3/CSA B45.4.
2. Material: 18 gauge, type 302 stainless steel.
3. Each Drain: Grid with 1-1/2” tailpiece and p-trap; removable conical basket strainer with metal stem and rubber stopper, equivalent to Elkay model LK36.
4. Drain Location: Centered in compartment.
5. Mounting: On counter with sealant.

B. Faucets: Manual-type, single-control mixing valve, gooseneck with pull-down spray..

1. Basis of Design: Delta 9182-AR-PR-DST.
2. Standard: ASME A112.18.1/CSA B125.1.
3. General: Single-control mixing valve, 6 ¾”” reach gooseneck with pull-down spray.
4. Finish: Artic Stainless
5. Number Required: One.
6. Faucet Mounting: On ledge.
7. Mounting Type: Deck, exposed.
8. Valve Handle(s), Spout: Per Drawing schedules.
    a. Spout Outlet: Aerated stream or spray.

2.11 MOP SERVICE BASIN

A. Description: One piece, floor mounted, mop basin with faucet and accessories.

1. Standard: IAPMO/ANSI Z124.6.
2. Material: Cast polymer composite.
3. Color: White.
4. Drain: Dome stainless steel grid with 3” outlet.

B. Mounting: On floor and flush to wall.

C. Faucet: Wall mounted, hot and cold faucet with wall brace and pail-hook.

1. Standard: ASME A112.18.1/CSA B125.1.
2. General: Include hot- and cold-water indicators.
    a. Material: Commercial, solid brass.
    b. Finish: Polished chrome plate.
    c. Check Stops: Provide on hot and cold water.
3. Mounting Type: Back/wall, exposed.
4. Valve Handle(s):
    a. Non-ADA: 2-inch lever.
    b. ADA Compliant: 6-inch elbow blades.
5. Spout: Rigid.

a. Vacuum Breaker: Required for hose outlet.
b. Spout Outlet: 3/4” hose thread.

D. Accessories:

1. 3-foot length of 5/8” hose with bracket equivalent to Fiat model 832AA .
2. Mop Hanger equivalent to Fiat model 889CC.
3. 12” stainless steel splash guard.

2.12 WALL FAUCET

A. Description: Wall mounted, hot and cold faucet with wall brace and pail-hook.

1. Standard: ASME A112.18.1/CSA B125.1.
2. General: Include hot- and cold-water indicators.
   a. Material: Commercial, solid brass.
   b. Finish: Polished chrome plate.
   c. Check Stops: Provide on hot and cold water.
3. Mounting Type: Back/wall, exposed.
4. Valve Handle(s):
   a. Non-ADA: 2-inch lever.
   b. ADA Compliant: 6-inch elbow blades.
5. Spout: Rigid.
   a. Vacuum Breaker: Required for hose outlet.
   b. Spout Outlet: 3/4” hose thread.

2.13 ELECTRIC WATER COOLERS WITH BOTTLE FILLER

A. Description: Self-contained, ADA compliant, wall hung electric refrigerated water cooler and filtered bottle filling station.

B. Water Cooler Cabinet: Bi-level with two attached cabinets, vinyl-covered steel with stainless-steel top.

1. Drain: Grid with 1-1/4” tailpiece with p-trap.
2. Bubbler: One, with adjustable stream regulator, located on each cabinet deck.
3. Control: Push bar.
4. Mounting: Flush to wall.

C. Bottle Filling Station: Touchless activation with auto timed shut-off, LED filter replacement indicator.

1. Filtration System: 3000-gallon capacity, for taste, odor, lead, chlorine reduction.
2. Materials: Stainless steel with ABS alcove.
3. Extra Filters: Provide 3 additional sets.

D. Cooling System: Electric, with hermetically sealed compressor, cooling coil, air-cooled condensing unit, corrosion-resistant tubing, refrigerant, corrosion-resistant-metal storage tank, and adjustable thermostat.

1. Electrical: 120/1/60.
2. Minimum Capacity: 7 gph.

2.14 SUPPLY FITTINGS

A. Article applies to tank type water-closets, sinks, and lavatories.

B. Manufacturers: Subject to compliance with requirements, provide supply stops by one of the following or other prior approved:

1. Dahl Valve Limited.

C. Exposed Supply Piping: Chrome-plated-brass pipe or chrome-plated-copper tube matching water-supply piping size. Include chrome-plated wall flange.

D. Stop: Chrome-plated-brass, one-quarter-turn, ball-type or compression stop.

1. Operation: Wheel handle.

E. Riser Material: 1/2” braided-stainless-steel flexible hose riser.

2.15 SHOWER – INSTITUTIONAL

A. Description: Surface mounted shower system.

1. Standard: ANSI A112.18.1M.
2. Type: Surface mounted shower system, mixing valve and hand held-head.

B. Standard Features: Hand-held shower head, high and low post mounting brackets, soap dish, service stops and vertical shroud to 8’-0” ceiling.

C. Covering: 18 gauge 304 stainless steel, brush finish.

D. Mixing Valves: Pressure balanced with built-in check and adjustable handle stop.

E. Shower Heads: Hand-held with on-off control, 60” stainless steel flexible hose and elevated in-line backflow preventer with quick-disconnect for flexible hose.

1. Flow: 2.0 gpm.

2.16 PROTECTIVE SHIELDING PIPE COVERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following or prior approved:

1. Engineered Brass Company.
2. Insul-Tect Products Co.; a subsidiary of MVG Molded Products.
3. McGuire Manufacturing.
4. Plumberex.
5. Truebro; a brand of IPS Corporation.
6. Zurn Industries, LLC; Tubular Brass Plumbing Products Operation.

B. Description: Manufactured plastic wraps for covering plumbing fixture hot- and cold-water supplies and trap and drain piping. Comply with Americans with Disabilities Act (ADA) requirements.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General Installation:

1. Install fixture supports firmly attached to building structure.
2. Install fixtures level, plumb, and in accordance with manufacturer's rough-in instructions and height requirements of authorities having jurisdiction.

B. Wall Flange and Escutcheon Installation:

1. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations and within cabinets and millwork.
2. Install deep-pattern escutcheons if required to conceal protruding fittings.

C. Joint Sealing:

1. Seal joints between fixtures and walls and floors using sanitary-type, one-part, mildew-resistant silicone sealant.
2. Match sealant color to fixture color.

D. Flush Valve Installation:

1. Install lever-handle flush valves for accessible water closets and urinals with handle mounted on open side of water closet.
2. Install actuators in locations that are easy for people with disabilities to reach.

E. Install toilet seats on water closets.

F. Lavatory Installation:

1. Install water temperature limiting devices on all public lavatories.
2. Install supports, affixed to building substrate, for wall-mounted lavatories.

G. Sink Installation:

1. Install supports, affixed to building substrate, for wall-hung sinks.
2. Install water-supply piping with stop on each supply to each sink faucet in locations where they can be easily reached for operation.

H. Shielding Installation:

1. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible sinks and lavatories.

I. Water Cooler Installation

1. For fixtures indicated for children, install at height required by authorities having jurisdiction.
2. Install off-the-floor carrier supports, affixed to building substrate, for wall-mounted fixtures.
3. Install water-supply piping with shutoff ball valve on supply to each fixture to be connected to domestic-water distribution piping. Install valves in locations where they can be easily reached for operation.
4. Where a bottle filler is installed in a stand-alone application in a staff break room or other, coordinate the height and location of the fixture to ensure it does not interfere with cabinet door swings or drawer opening distances.

3.2 CONNECTION SCHEDULE

A. Unless otherwise indicated on the Plans, rough-in sizes for waste, vent and supply connections shall be as follows:

		Waste	Vent	Supply
1.	Water Closets (Flush Valve)	3"	2"	1"
2.	Lavatories	1-1/2"	1-1/2"	1/2"
3.	Urinals	2"	1-1/2"	3/4"
4.	Service Sinks	3"	1-1/2"	3/4"
5.	Hose Bibbs/Wall Faucets	3"	1-1/2"	3/4"
6.	Sinks	2"	1-1/2"	1/2"
7.	Electric Water Coolers	1-1/2"	1-1/2"	1/2"
8.	Shower	2”	1-1/2”	1/2"

3.3 ADJUSTING

A. Operate and adjust fixtures and controls. Replace damaged and malfunctioning fixtures, fittings, and controls.

B. Adjust water pressure at bubblers, faucets and flushometer valves to produce proper flow.

C. Install fresh batteries in battery-powered, electronic-sensor mechanisms.

D. Set field-adjustable temperature set points of temperature-actuated water mixing valves. Adjust set point within allowable temperature range.

3.4 CLEANING AND PROTECTION

A. Clean fixtures and fittings with manufacturers' recommended cleaning methods and materials.

B. Do not allow use of fixtures after final cleaning for temporary facilities unless approved by Owner.

END OF SECTION

SECTION 230500 – HVAC GENERAL PROVISIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Specification Format

1. These Specifications are written in imperative and abbreviated form. This imperative language of the technical sections is directed at the Contractors, unless specifically noted otherwise. Incomplete sentences shall be completed by inserting "shall", "the Contractor shall", and "shall be", and similar mandatory phrases by inference in the same manner as they are applied to notes on the Drawings. The words "shall be" shall be supplied by inference where a colon (:) is used within sentences or phrases. Except as worded to the contrary, perform all indicated requirements whether stated imperatively or otherwise.
2. Three Part Format
    a. "Part 1 - General": Covers those areas which relate to the Work, and which define the general administrative and technical requirements specific to a particular section.
    b. "Part 2 - Products": Defines, in detail, the acceptance equipment and materials to be incorporated into the Work.
    c. "Part 3 - Execution": Describes, in detail, the manner in which items covered by Part 2 are to be incorporated into the Work.
3. Where Codes, Specifications and Drawings are in conflict, the Contractor will be deemed to have bid the more expensive method. Refer all such discrepancies immediately to the Engineer prior to commencing related work.

B. Definitions:

1. Furnish: Supply equipment as required by these Drawings and Specifications, delivered to the job site for installation or use by others.
2. Install: Fix in position for total operational use all apparatus as shown, specified or required. Provide all miscellaneous fittings and wiring supplies.
3. Or Approved Equal: Equipment or materials selected by Contractor subject to Engineer's acceptance.
4. Or Equivalent: Equipment or materials selected by Contractor matching the function and performance of equipment or materials listed.
5. Provide: Furnish and install in place, total and operational.
6. Complete/Completely: All pipes, fittings, ducts, wiring supplies, and accessories provided for the noted equipment from the equipment to the mains or noted termination points.

1.2 SCOPE OF WORK

A. The work covered by this Division consists in furnishing all labor, equipment, accessories and materials and in performing all operations necessary for the installation of the HVAC systems, in strict accordance with Division 23 of this Specification and applicable Drawings and subject to the terms and conditions of the Contract.

B. Work of this Division is subject to requirements of Instructions to Bidders, General Conditions, Supplementary Conditions, Division One, and all other sections of this Specification.

C. Examine site and all Contract documents prior to submittal of bid.

1. Submittal of a Bid shall indicate the Contractor has examined the Site and Drawings and has included all required allowances in this Bid. No allowance shall be made for errors resulting from the Contractor's failure to visit job sites and to review Drawings.

D. Division 23 Work: Includes, but is not limited to, providing the following:

1. Hydronic Heating System: Piping, plant equipment, fuel supply, heating equipment.
2. Hydronic Heat Pump System: Piping, plant equipment, cooling equipment.
3. Air Distribution System: Equipment and ductwork.
4. Ventilation and Exhaust System: Equipment and ductwork.
5. Building Automation System.
6. Insulation System: Ductwork and piping.

1.3 ALTERNATES

A. Refer to Division 1 for alternates.

1.4 CONTINGENCY

A. Refer to Division 01 for amount to include in Mechanical Bid.

1.5 SUBMITTALS

A. General:

1. Preferred Submittal Format: PDF, unless otherwise noted.
2. Preferred Submittal Nomenclature: Unless otherwise noted, PDF submittals are to be named according to the following:
   a. [Specification Section Number] – [Specification Name or Equipment Included]
3. Distribution: Unless otherwise noted, direct all correspondence concerning Division 23 submittals to:

Caleb Bulow
Prairie Engineering, P.C.
1905 17TH Street SE
Minot, ND 58701
cbulow @prairieengineeringpc.com

B. Substitution and Prior Approval to Quote:

1. Format and Content: Complete descriptive technical data on the proposed item consisting of model numbers, type, size and performance characteristics.
2. Submission Timing: Minimum of 192 hours (eight days) prior to bid opening.
   a. Substitutions will not be permitted after bid opening except where such substitution is considered by the Engineer to be in the best interest of the Owner.
3. Bidder Notification: Prior to bid opening via Addenda, sent to all planholders.
4. Contractor Responsibility: This contractor will be responsible for all coordination, construction costs, and Architectural/Engineering design fees required to substitute equipment that has different characteristics than designed including weights, physical dimensions, clearances, mechanical characteristics, electrical characteristics, and other characteristics deemed important to the design by the Architect/Engineer.
5. Alternative Format: Printed paper, two copies; Self-addressed, stamped envelope required for return reply.

C. Schedule of Values

1. Distribution: One copy to Engineer.
2. Format and Content: When included with the Bid, at minimum the following categories shall be indicated:

a. "Project mobilization"
b. "Start-up and Commisioning"
c. "Demolition"
d. "Excavation and Backfill"
e. "Insulation"
f. "Test and Balance"
g. "Building Automation System"
h. "Fire Sprinkler System"
i. "Piping Systems" (all hot/chilled/geothermal piping, valves, fittings, hangers, installed in place)
j. "Sheet Metal" (all ductwork, lining, dampers, hangers, installed in place)
k. "Terminal Units" (unit heaters, grilles, diffusers, radiation, installed in place)
l. "Hydronic Distribution Equipment" (all pumps, boilers, chillers, heating/cooling coils, installed in place)
m. "Air Distribution Equipment" (all fans, air handlers, heat pumps, VAVs, installed in place)

3. Submission Timing: Prior to first payment application.

D. Shop Drawings

1. Distribution: Engineer via the Prime Contractor for each item indicated.
2. Format and Content: Include catalog numbers, performance data, dimensions and other descriptive information.
   a. Contractor Review: Dated and signed cover sheet or review stamp for each Shop Drawing file to indicate thorough review. **Email message text not acceptable.**
   b. Submit a separate shop drawing file for each Specification Section including only the items within that Section.
   c. Non-Conforming: Returned to Contractor without review.
3. Submission Timing: Prior to delivery of materials to job site.

E. Record Drawings

1. Format and Content: Paper copy of Drawings project site.
   a. As work progresses, Contractor's field supervisor shall mark Record Drawings in red pencil to indicate actual conditions of installation.
   b. Give particular attention to marking actual locations of underground piping.
   c. Affix all addendum and change order descriptions to appropriate record drawing sheet, utilizing spray adhesive.
   d. Make Record Drawings available to Engineer during project visitation.
2. Submission Timing: Close of project with Record Manuals.

F. Spare Equipment and Devices

1. Distribution: Owner.
2. Format and Content: List quantities on contractor letterhead or invoice, obtain signature of Owner's representative acknowledging receipt, and include with each Record Manual.
3. Submission Timing: Close of project with Record Manuals.

G. Operation and Maintenance Manuals

1. Submission Timing: Close of project, as condition of its acceptance.
2. Record Manual information shall be included for all equipment/material where Shop Drawings are required.
3. Format and Content: Two copies, Loose-leaf hardcover binders, **and** in PDF format on CDs or USB drive.

a. List project name, date, Contractor's name, address and telephone number on exterior label of each Record Manual and CD.
b. Include an index sheet indicating subcontractor and subcontractor's phone number; and each major piece of equipment, supplier and supplier's telephone number. Provide tabbed dividers indicating major groupings of equipment.
c. Include a copy of the Shop Drawings.
d. Include all installation, operation and maintenance data packaged with any equipment.
e. Include all signed and dated final punch lists from walkthroughs performed by the Engineer.

1.6 APPLICATIONS FOR PAYMENT

A. Refer to Section 01 2000 Price and Payment Procedures.

B. Provide one additional copy, sent directly to the Engineer.

C. Schedule of Values: At minimum, include items in Submittal article.

1.7 CHANGES TO CONTRACT

A. Refer to Section 01 2000 Price and Payment Procedures.

1.8 QUALITY ASSURANCE

A. Qualifications of Installers

1. For installation and testing, use only trained licensed and experienced workmen familiar with items required and manufacturer's recommended methods.
2. In acceptance or rejection of installed work, no allowance will be made for lack of skill on the part of the workmen.

1.9 AUTHORITIES AND AGENCIES

A. Materials, workmanship and installation: comply with the latest editions of all applicable codes, local ordinances, industry standards, utility company regulations, insurance carrier requirements and these Specifications.

B. Obtain and pay all permits, inspections, licenses and other charges pertaining to the Work. Upon completion of the Work, furnish proof of acceptance by proper agency having jurisdiction.

C. Codes and standards shall include, but not necessarily be limited to, the following:

1. International Energy Conservation Code (IECC);
2. Uniform Plumbing Code;
3. North Dakota State Building Code;
4. International Building Code (IBC);
5. International Mechanical Code (IMC);
6. International Fuel Gas Code (IFC);
7. National Fire Protection Association (NFPA) – Sections as adopted by authority having jurisdiction.

D. The more stringent provisions shall govern where provisions of pertinent codes and standards conflict with these Specifications or Drawings. Where Codes, Specifications or Drawings differ with one another, the Contractor will be deemed to have bid the more expensive method. Refer all such discrepancies to the Engineer immediately.

1. Pertinent codes and standards shall not be cited to furnish less than specifically shown or specified.

2. Meeting the minimum standards of the above Codes does not permit a lower grade of construction where Plans or Specifications call for workmanship or materials in excess of Code Requirements.

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.10 GUARANTEE AND WARRANTY

A. Except where otherwise noted, contractor shall guarantee materials, workmanship and the proper operation of equipment for a period of one year after Owner's beneficial use of the building or mechanical system. Contractor shall correct all equipment, material and workmanship found to be defective or non-conforming to the contract documents without cost to Owner during that one year period.

B. Guarantee shall include trips to the project site by Contractor to adjust mechanical equipment as required, ensuring it is operating as intended.

C. Specified guarantee shall not relieve Contractor from liability arising from improper installation or non-compliance with applicable codes.

1.11 TEMPORARY FACILITIES

A. Refer to Special Conditions and/or Division 1 for details of temporary facilities.

1.12 NOMENCLATURE

A. Pipe sizes listed are nominal pipe sizes throughout this Division except where otherwise noted.

PART 2 - PRODUCTS

2.1 MATERIAL

A. Material and equipment shall be as shown or specified. Provide material not specifically described but required for a complete and proper installation of the Work, subject to the acceptance of the Engineer.

B. Owner will not be liable for material installed in non-compliance with codes, standards, and these Contract Documents.

C. Fire Stop System material shall be by 3M “Fire Barrier”, Metacaulk, Hilti, Nelson Firestop Products, or AD Fire. See Division 07 for further details on approved materials.

2.2 ELECTRIC WIRING:

A. The Division 23 Contractor shall furnish all motors, special controls and electrical devices as specified herein for proper operation of the equipment furnished.

B. Division 26 Contractor shall furnish and install, as required, disconnects, starters, switches, etc., and do all necessary power and control wiring including the installation of electrical devices such as thermostats, humidistats, remote control panels, etc., furnished separately by Division 23 Contractor, unless otherwise noted in Equipment Specifications or noted in Section 230900.

PART 3 - EXECUTION

3.1 GENERAL

A. Engineer, Architect, or Owner shall not be responsible for the means, methods, techniques, sequences or procedures of construction selected by Contractor.

B. Engineer, Architect, or Owner shall not be responsible for safety precautions and programs incidental to work of Contractor.

C. It is the sole responsibility of Contractor to initiate, maintain, and supervise all safety precautions and programs in connection with the Work.

D. In general, it is intended that ductwork and piping be installed parallel to building lines, unless otherwise shown on the Drawings, and that equipment be located symmetrical with the architectural elements of the building.

3.2 SURFACE CONDITIONS

A. Prior to work of each Section of Division 23, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

B. Verify that work of this Division may be installed in accordance with all pertinent codes, regulations and standards.

3.3 PRODUCT HANDLING

A. Protection: Use all means necessary to protect the materials of this Division before, during and after installation and to protect the installed work and materials of all other trades.

B. Plugs: Install in ends of uncompleted piping at end of each day or when work stops.

C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

3.4 COORDINATION

A. Order equipment and material in a timely fashion to assure it is on the job site when required.

B. Coordinate installation of material with schedule of other trades to prevent unnecessary delay in construction schedule.

C. Division 23 piping, duct and equipment installations shall comply with National Electrical Code requirements 110.26 "working spaces" and "dedicated spaces". Mechanical ducts and pipes shall not be installed in the space near electrical panels/equipment defined as "working spaces" or "dedicated spaces".

3.5 DISCREPANCIES, CONSTRUCTION CONFLICTS AND DRAWINGS

A. Discrepancies

1. Prior to submitting bid, Contractor shall refer any apparent discrepancies or omissions to Engineer for clarification.
2. The Architect, Engineer or Owner will not be responsible for any oral instructions or modifications to the contract documents prior to opening of bids.
3. Written interpretation or clarification will be made by Addenda.

B. Construction Conflicts

1. Conflicts discovered during construction shall be immediately called to the attention of the Engineer for decision.
2. Do not proceed with installation in area of question until conflict has been fully resolved.

3. When so directed by Engineer, Contractor shall make minor adjustment to avoid interferences with other trades. Such minor adjustments shall be performed at no additional cost to the Architect, Engineer or Owner.

C. Drawings

1. Drawings indicate extent and general layout of mechanical systems for project. Due to small scale, it is not possible to indicate all fittings and accessories that may be required. Provide such fittings and accessories as required to form a complete and operating system in general conformance with Specifications and Drawings.
2. Exact locations, distances, levels and other conditions will be governed by the structure. Field measurements shall take precedence over the Drawings. Use the Drawings and these Specifications for guidance. Secure the Architect's approval for all changes in locations.
3. Verify all measurements at site. No compensation will be made because of difference between locations shown on the Drawings and measurements at the building.
4. Refer to the architectural drawings for dimensions and locations of walls, partitions, doors, windows, ceiling heights, door swings and other details of construction.

3.6 UNDERGROUND UTILITIES

A. Locations of existing underground utilities are based on available site information and are shown approximately. Contractor shall determine exact utility locations before commencing work and shall be responsible for repair of damages resulting from his construction activities to pre-construction condition.

B. Trench and backfill for installation of underground piping to depth shown or required. Remove any accumulated water in excavation by pumping. Shore and brace excavation as required by safety regulations. Provide temporary bridges to maintain normal traffic flow. Excavation and backfill required by mechanical installations shall be accomplished in accordance with Division 31 Specifications by this Contractor.

3.7 REMOVAL AND/OR REUSE OF EXISTING MATERIALS AND EQUIPMENT

A. Existing equipment, which is indicated as being removed and not indicated for reuse, shall remain the property of the Owner, stored as directed. Any material the Owner does not wish to retain shall be removed and disposed by the Contractor.

B. Contractor shall assume in his Bid that existing equipment and materials shown to be reused are in good working condition and can be installed without any repairs. If certain items are found to be in need of repair or in unusable condition, Contractor shall notify the Engineer for decision, however, Contractor shall be responsible for any damage by his personnel to equipment in removal or handling.

C. All refrigeration equipment and piping to be removed or relocated shall have the refrigerant removed prior to removal or demolition. Removal and reclamation of refrigerant shall be done by qualified, trained and certified refrigeration technicians. Certification shall meet all requirements as set forth by Section 608 of the Clean Air Act Amendments. Contractor shall use approved recovery and reclaiming equipment and approved containers for refrigerant storage. Flashing refrigerant gas to atmosphere is strictly prohibited.

D. Material and other equipment removed and to be reused shall be cleaned before reinstallation.

3.8 OFFSETS

A. Where required to allow clearance of electrical conduit and outlet boxes, beams, etc., to avoid interference with work of other trades, to increase head room under mechanical systems or to improve the appearance of mechanical systems work, this Contractor shall offset his mechanical system as directed by the Architect/Engineer.

3.9 CUTTING AND PATCHING

A. Refer to General Conditions. Unless specifically called out to be performed by other Contractors, the Division 23 Contractor shall perform all cutting and patching required for the installation of material and equipment furnished under his Contract.

B. Opening/holes cut to allow passage of ducts and pipes through concrete floor shall be patched by the Contractor doing the cutting unless indicated otherwise on the Drawings.

C. Fire-Barrier Penetrations

1. Pipe penetrations through fire rated walls and floors shall be sealed with a UL classified Fire Stop System. Fire Stops shall be provided in accordance with the appropriate System No. as it relates to pipe size/Material and wall or floor rating/material.
2. See Specification Section 230510 for other Fire-Barrier Penetration requirements.
3. See Section 2 article “Materials” of this Specification for approved fire stop system material.

D. Openings between ductwork and fire rated walls and floors shall be sealed with fire rated caulking or steel collars on both sides of wall or floor.

E. Restore damaged surfaces to their original condition by skilled mechanics of the trade involved. Contractor at fault shall assume all cost.

F. Use only rotary type drilling tools to cut concrete.

G. Do not endanger the stability of the structure. Do not at any time cut or alter work of any other Contractor without Architect's consent.

3.10 FIELD QUALITY CONTROL

A. Perform field tests and inspections. Test new piping and parts of existing piping that have been altered, extended, or repaired.

B. Low Pressure Hydronic Piping Tests: Maintain constant pressure.

1. Pressure: Minimum of 100 psig.
2. Duration: One hour.

C. Gas Piping Tests:

1. Test gas piping as required by the Authority Having Jurisdiction or the Utility Company.
2. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.

D. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained. Piping will be considered defective if it does not pass tests and inspections.

3.11 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.12 CLEANING

A. Clean interior of duct and piping systems. Remove dirt and debris as work progresses.

B. The hydronic water systems shall be cleaned as follows:

1. The Division 23 Contractor shall arrange for the services of the local area Chemsearch or Garrett-Callahan water treatment specialist to help with chemically cleaning the new piping systems.
2. Division 23 Contractor shall utilize Garrett-Callahan Formula 247 to degrease, descale and generally clean the piping according to the recommendations of the company specialist. After completion of this work, the Contractor shall add the proper quantity of Garrett-Callahan Formula 12L corrosion inhibitor or provide a Nitrite residual of 500-1000 ppm. Equivalent products by Chemsearch, Dearborn, Brentag, or Agassiz Chemical are acceptable.

3.13 INSTRUCTIONS

A. Provide written and oral operating and maintenance instructions to Owner's representatives. The oral instructions shall be given before the Owner occupies the buildings. Instructions to include **all** building's mechanical systems and equipment.

B. Copies of written operating and maintenance instructions shall be included with each Record Manual.

C. Division 23 Contractor shall coordinate with Owner at Owner's convenience, formal instruction time for contractor personnel to instruct Owner's Representatives on all equipment. Provide similar equipment supplier's instructions where specified thus.

D. Formal instructions shall be video recorded when required by other Sections of this Specification by this Contractor. Format shall be DVD. Formal instruction to be included with each Record Manual, being referenced to and a part of the Manual.

3.14 CLEAN UP

A. Each Contractor shall be responsible for cleaning up after his work, including the removal of all scrap material left on the job by his men or Subcontractors. This will include the removal of all pipe and sheet metal cuttings, pieces of sheet metal, pipe, and insulation and other debris.

B. Clean all heating units, clean and straighten fins on all coils, clean scale, dirt or debris off piping, motors, etc., oil or grease all motors, fan bearings, pump gear boxes, etc., and leave in a clean best possible working condition. Install clean filters in ventilation system prior to turning job over to Owner.

C. After all tests have been made and the mechanical systems are operating properly, this Contractor shall go over the entire system and remove labels from all mechanical equipment.

D. All equipment having finished paint surfaces shall be examined upon completion for scratches and other damage. Touch up all surfaces as required with paint of color to match factory finish.

E. Perform all cleaning as required by other Sections of Division 23.

END OF SECTION

SECTION 230510 – COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Ball valves.
2. Butterfly valves.
3. Check valves.
4. Flexible Connectors.
5. Hangers.
6. Escutcheons.
7. Equipment and Warning labels.
8. Rooftop piping and duct supports.
9. Roof curbs.
10. Pipe labels.
11. Fire-Barrier Penetrations.

B. Nomenclature:

1. SWP: Steam working pressure.
2. CWP: Cold working pressure.

1.2 SUBMITTALS

A. Shop Drawings: For equipment covered under this section as per Section 230500.

1. Product Data: Each type of valve, gauge, strainer, sleeve, and sleeve-seal system.
2. Fire-Barrier Penetrations: UL Classified System, System Number.

B. Operation and Maintenance Data: To include in operation and maintenance manuals as per Section 230500.

PART 2 - PRODUCTS

2.1 VALVE MANUFACTURERS

A. Except in other Part 2 articles where noted, the following manufacturers are acceptable:

1. Anvil International.
2. Conbraco Industries, Inc.; Apollo Valves.
3. Milwaukee Valve Company.
4. Nexus Valve.
5. NIBCO INC.
6. Watts Regulator Co.; a division of Watts Water Technologies, Inc.

B. All manufacturers are subject to compliance with requirements

C. Provide products by one of the manufacturers specified or by prior approval.

2.2 GENERAL REQUIREMENTS FOR VALVES

A. Refer to valve schedule articles for applications of valves.

B. Valves in Insulated Piping: With 2-inch stem extensions and the following features:

1. Gate Valves: With rising stem.

2. Ball Valves: With extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.
3. Butterfly Valves: With extended neck.

2.3 BALL VALVES

A. Two-Piece, Metal, Ball Valves:

1. Basis of Design: Apollo Valves 70-100 Series.
2. Standard and Rating: MSS SP-110; 150 psi SWP, 600 psi CWP at 500°F.
3. Body Design: Two piece, forged brass or bronze; PTFE or TFE seats.
4. Stem: Brass or Bronze, blowout-proof, packing nut.
5. Ball: Chrome-plated brass, full or regular port.
6. Operator: Lever; separate lever nut.

2.4 BUTTERFLY VALVES

A. Iron, Single Flange Butterfly Valves:

1. Basis of Design: Nibco LD 2000
2. Standard and Rating: MSS SP-67, 200 psig, 5°F to 250°F.
3. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange; extended neck.
4. Body Material: Epoxy coated; ASTM A 126, cast iron or ASTM A 536, ductile iron; EPDM seat.
5. Stem: One- or two-piece stainless steel.
6. Disc: Aluminum bronze.
7. Operator: Lockable handle for 5” and smaller, gear for 6” and larger.

B. Iron, Grooved End Butterfly Valves:

1. Basis of Design: Victaulic Vic-300 MasterSeal.
2. Standard and Rating: 300 psi CWP (2065 kPa)
3. Body Design: Body shall be grooved end black enamel coated ductile iron conforming to ASTM A536.
4. Valve Bearings: Valve bearings shall be TFE lined fiberglass, and stem seals shall be of the same grade elastomer as the valve seat.
5. Disc: Disc shall be stainless steel or aluminum bronze with blowout proof 416 stainless steel stem. Disc shall be offset from the stem centerline to allow full 360-degree circumferential seating.
6. Operator: Valve operators shall be lever handle or gear operator, available with memory stop feature, locking device, chainwheel, or supplied bare.

2.5 CHECK VALVES

A. Check Valve – Bronze Swing:

1. Basis of Design: Nibco T-413-B, threaded end; Nibco S-413-B, solder end.
2. Standard and Rating: MSS SP-80; 200 psig CWP; 350°F.
3. Body Material and Design: ASTM B 62, bronze; Y-pattern body; bronze disc.

B. Check Valve – Iron Silent:

1. Basis of Design: Nibco W-910-B, wafer style; Nibco F-910-B, flanged globe style.
2. Standard and Rating: MSS SP-125; 200 psi CWP, 200°F.
3. Body Design: Horizontal inline with sliding disc.
4. Body Material: ASTM A 126, gray iron.
5. Actuator: Stainless steel spring.

6. Seat and Disc: ASTM B584 Cast bronze.

C. Check Valve – Grooved End:

1. Basis of Design: Victaulic Series 716
2. Standard and Rating: MSS SP-125, 300 psi (2065 kPa)
3. Body Design: enamel coated ductile iron body, stainless steel spring and shaft, welded-in nickel seat.
4. Body Material: Black enamel coated ductile iron body.
5. Actuator: Stainless steel spring and shaft.
6. Seat and Disc: ASTM A-536, elastomer encapsulated ductile iron disc.

2.6 SAFETY RELIEF VALVE

A. Description: ASME Section IV water pressure relief valves.

B. Basis of Design: Kunkle Model 537.

C. Description: ASME Section IV, low pressure steam and hot water boilers, “HV” National Board certified safety relief valve, rated for maximum 160 psig and 250 °F.

D. National Board Certification: “HV”.

E. Body Design: Spring loaded with adjusting ring and lever.

1. Seat: ASTM B584 bronze.
2. Spring and stem: Stainless steel.
3. Isolating Diaphram: BUNA-N/Nylon
4. Set Pressure: 50 psig.

F. Body Material:

1. 1” and Smaller: ASTM B584 bronze.
2. 1-1/2” and 2”: ASTM A126 cast iron.

2.7 FLEXIBLE CONNECTORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Flexicraft Industries.
2. Keflex; Flex-Weld Incorporated.
3. Mason-Mercer.
4. Metraflex Company.
5. Minnesota Flexible Corp. (MFC).
6. Thermo Tech Inc.
7. Twin City Hose.

B. Body: Stainless-steel bellows with woven, flexible, stainless steel or bronze, wire-reinforcing protective jacket rated for 150 psig maximum operating pressure and 250 °F maximum operating temperature.

C. End Connections: Threaded or flanged to match equipment connected.

D. Performance: Capable of 3/4-inch misalignment.

2.8 PIPE HANGERS AND SUPPORTS

A. Carbon-Steel Pipe Hangers and Supports:

1. Description: Clevis type with locknut to threaded extension rod, factory-fabricated components; MSS SP-58 types 1 through 58.
2. Galvanized Metallic Coatings: Pregalvanized or hot dipped.
3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
5. Hanger Rods: Continuous-thread rod, nuts, and washer made of galvanized or cadmium plated steel.

B. Copper Pipe Hangers:

1. Description: Clevis type with locknut to threaded extension rod, copper-coated-steel, factory-fabricated components; MSS SP-58 types 1 through 58.
2. Hanger Rods: Continuous-thread rod, nuts, and washer made of galvanized steel.

C. Trapeze Pipe Hangers:

1. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

D. Plastic Pipe Support Channel

1. Description: 18 Ga. steel v-channel; standard finish.

2.9 DUCT HANGERS AND SUPPORTS

A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.

B. Strap and Rod Sizes: 1”, 16 gauge straps; 3/8” rod.

C. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.

D. Steel Cables for Stainless-Steel Ducts: Stainless steel complying with ASTM A 492.

E. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.

F. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

2.10 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.11 MISCELLANEOUS MATERIALS

A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.

2.12 ESCUTCHEONS

A. One-Piece, Cast-Brass Type: With polished, chrome-plated finish and setscrew fastener.

2.13 EQUIPMENT AND WARNING LABELS

A. General Requirements

1. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

2. Minimum Letter Size: 1/2 inch for name of units. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
3. Fasteners: Stainless-steel rivets or self-tapping screws.
4. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Metal Labels for Equipment:

1. Material and Thickness: Non-corroding metal, 20 gauge minimum thickness, and having predrilled or stamped holes for attachment hardware.

C. Plastic Labels for Equipment and Warning:

1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
2. Equipment Label Color: Black letters on white background.
3. Warning Label Color: White letters on red background.
4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

D. Warning Label Content: Include caution and warning information, plus emergency notification instructions.

E. Equipment Label Content: Include equipment's Drawing designation or unique equipment number.

F. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing plan numbers where equipment is indicated, plus the Specification Section number and title where equipment is specified. Equipment schedule shall be provided to the Controls Contractor and included in operation and maintenance data.

2.14 ROOFTOP PIPING AND DUCT SUPPORTS

A. Description: Weatherproof, factory assembled support with base suitable for any type roofing material.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Cooper B-Line.
2. C-Port; Clearline Technologies.
3. C-Port; MIFAB.
4. Erico.

C. Material:

1. Channel: Galvanized steel.
2. Base: U.V. resistant, non-damaging to roofing material; polymer or rubber.

D. Capacity: 1,500 lbs.

2.15 ROOF CURBS

A. Description: Galvanized-steel sheet; with mitered and welded corners; and 1-1/2-inch wood nailer. Size as required to fit roof opening and equipment base.

1. Configuration: Self-flashing without a cant strip, with mounting flange.
2. Height: Minimum 18 inches above the finished top of the roof, unless otherwise indicated. For fresh air/intake hoods, minimum height shall be 20 inches above the finished top of the roof.
3. Insulation: 1-1/2-inch-thick, rigid fiberglass, adhered to inside walls.
4. Coordination: The Mechanical Contractor shall furnish and install the roof curbs and coordinate with the insulation thickness on roofs where the insulation is above the roof deck

and provide pressure treated wood blocking to bring the curb above the insulation and membrane. In lieu of wood blocking, a full height prefabricated curb with a raised cant is acceptable if the height of the raised cant is the same height of the insulation thickness and the minimum height above the top of the finished roof is maintained.

2.16 PIPE LABELS

A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.

B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.

C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.

D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.

1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
2. Lettering Size: At least 1-1/2 inches high.

2.17 FIRE-BARRIER PENETRATIONS

A. Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with Approved firestop materials. See Section 230500 for further details.

PART 3 - EXECUTION

3.1 VALVE INSTALLATION

A. All valves shall be installed in accessible locations. If any valve is found to be installed in a location deemed inappropriate by the Owner and/or Engineer, the contractor shall relocate the valve at no additional cost to the owner.

B. Install shutoff-duty valves at each branch connection to supply mains, and at supply connection to each piece of equipment.

C. Install valves in horizontal piping with stem at or above center of pipe in position to allow full stem movement.

D. Install manual gas shutoff valve for each gas appliance ahead of corrugated stainless-steel tubing or copper connector.

E. Install natural gas regulators and overpressure protection devices with maintenance access space adequate for servicing and testing.

3.2 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

A. If valve applications are not indicated, use the following:

1. Shutoff Service: Ball, or butterfly valves.
2. Throttling Service: Ball or butterfly valves.
3. Pump-Discharge Check Valves:
    a. 2” and Smaller: Bronze swing check valves with bronze disc.
    b. 2-1/2” and Larger: Iron silent check valves with rubber seats.

B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP class or CWP ratings may be substituted.

C. Select valves, except wafer types, with the following end connections:

1. For Copper Tubing and Steel Piping, 2” and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
2. For Copper Tubing and Steel Piping, 2-1/2” and Larger: Flanged ends.

D. In general, ball valves are preferred over butterfly, gate, and globe valves on piping 2" and smaller. Butterfly are preferred on piping larger than 2”.

3.3 PIPE HANGER AND SUPPORT INSTALLATION

A. Metal Pipe-Hanger Installation: Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.

B. Metal Trapeze Pipe-Hanger Installation: Arrange for grouping of parallel runs of horizontal piping, and support together on trapeze pipe hangers.

C. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

D. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

E. Install hangers and supports to allow controlled thermal movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

F. Install lateral bracing with pipe hangers and supports to prevent swaying.

G. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.

H. Insulated Piping:

1. Attach clamps and spacers to piping.
   a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
   b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
   a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe 4” and larger if pipe is installed on rollers.
3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
   a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe 4” and larger if pipe is installed on rollers.
4. Shield Dimensions for Pipe: Not less than the following:
   a. 4” and smaller: 12 inches long and 0.06 inch thick.
   b. 5” and larger: 18 inches long and 0.06 inch thick.
5. Pipes 8” and Larger: Include wood or reinforced calcium-silicate-insulation inserts of length at least as long as protective shield.

I. Specific hanger and support requirements are in Sections specifying piping systems and equipment.

J. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.

K. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

L. Use carbon-steel pipe hangers and supports and metal trapeze pipe hangers and attachments for general service applications.

M. Use copper-plated pipe hangers and copper attachments for copper piping and tubing.

N. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
2. Steel Clevises (MSS Type 14): For 120 to 450 °F piping installations.

O. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
3. Side-Beam or Channel Clamps (MSS Type 20 or 25): For attaching to bottom flange of beams, channels, or angles.
4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
6. C-Clamps (MSS Type 23): For structural shapes.
7. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod.

P. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

Q. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.

R. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.

3.4 DUCT HANGER AND SUPPORT INSTALLATION

A. Hanger Spacing: Maximum of 10 feet apart:

1. Rectangular Duct: Pair of straps or rods.
2. Round Duct, up to 36” diameter: Single rod.
3. Round Duct, greater than 36” diameter: Double rods or straps.

B. Install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.

C. Hangers Exposed to View: Threaded rod and angle or channel supports.

D. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.

3.5 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make bearing surface smooth.

C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.6 EQUIPMENT LABEL INSTALLATION

A. Install or permanently fasten labels on each major item of mechanical equipment.

B. Locate equipment labels where accessible and visible.

3.7 PIPE LABEL INSTALLATION

A. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:

1. Near each valve and control device.
2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
4. At access doors, manholes, and similar access points that permit view of concealed piping.
5. Near major equipment items and other points of origination and termination.
6. Spaced at maximum intervals of 50 feet along each run.

3.8 FIRE-BARRIER PENETRATION PROTECTION

A. Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials.

B. Install Fire Stop Systems per the manufacturers guidelines.

3.9 VALVE SCHEDULE

A. Pipe 2” and Smaller:

1. Bronze and Brass Valves: May be provided with solder-joint ends instead of threaded ends.
2. Ball Valves.
3. Check Valves: Bronze swing.

B. Pipe 2-1/2” and Larger:

1. Butterfly Valves.
2. Check Valves: Iron Silent.

C. Gas Valves:

1. Ball Valves.

3.10 ESCUTCHEON AND FLOOR PLATE INSTALLATION

A. Install escutcheons for exposed piping penetrations of walls, ceilings, and floors of finished areas.

B. Install escutcheons for piping penetrations of walls within concealed cabinet spaces.

C. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.

D. Replace broken and damaged escutcheons using new materials.

END OF SECTION

SECTION 230520 – GENERAL MOTOR REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Common motor requirements for HVAC equipment.
    a. General requirements for motors for use on ac power systems up to 600 V and installed at equipment manufacturer's factory or shipped separately by equipment manufacturer for field installation.
2. Single-phase motors.
3. Three-phase motors.
4. Electrically commuted motors.
5. VFDs.
6. Shaft grounding rings.

1.2 VFD QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

1.3 SUBMITTALS

A. Product Data: Submit catalog data for each motor furnished loose. Indicate nameplate data, standard compliance, electrical ratings and characteristics, and physical dimensions, weights, mechanical performance data, and support points.

1.4 WARRANTY

A. Motor performance shall be warranted against material and workmanship defects by manufacturer’s warranty and service policy for the period of at least 18 months from the day of shipment from the factory or the manufacturer's warehouse.

1. Premium efficiency motors shall be warranted for 36 months.
2. Severe duty motors (as applicable) shall be warranted for 60 months.

B. VFDs: Manufacturer's standard form in which manufacturer agrees to repair or replace VFDs that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL MOTOR REQUIREMENTS

A. Comply with NEMA MG 1 unless otherwise indicated.

B. Motor Characteristics:

1. Duty: Continuous duty at ambient temperature of 105 °F and at altitude of 3500 feet above sea level.
2. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

2.2 SINGLE PHASE MOTORS:

A. Description: Single phase motor, T-Frame, 1.25 service factor, minimum class B insulation for 105°F ambient.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. ABB Automation Company.
2. General Electric.
3. Marathon.
4. Century.

C. Motors 1/20 HP and Smaller: Shaded-pole type.

D. Motors larger than 1/20 hp shall be one of the following, to suit starting torque and requirements of specific motor application:

1. Permanent-split capacitor.
2. Split phase.
3. Capacitor start, inductor run.
4. Capacitor start, capacitor run.

E. Multispeed Motors: Variable-torque, permanent-split-capacitor type.

F. Bearings: Prelubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.

G. Minimum Efficiency: 75 percent.

H. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

2.3 THREE-PHASE MOTORS:

A. Description: NEMA MG-1, T-frame, Design B, induction-type motor, minimum class F insulation for 105°F ambient.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. ABB Automation Company.
2. General Electric.
3. Marathon.
4. WEG.
5. TECO.
6. NIDEC.

C. Materials:

1. Windings: Copper.
2. Frame: Steel or cast iron.
3. Rotor: Random-wound, squirrel cage.
4. Bearings: Regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading, L-10 life of 200,000 hours.

D. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated.

E. Service Factor:

1. 1 HP and Smaller: 1.25
2. Above 1 HP: 1.15

F. Full-load Electrical Efficiency: Based on motor size as indicated below, and shall comply with ASHRAE 90.1-2013, whichever is greater:

1. 1 HP and Smaller: 81.5%
2. Above 1 HP to 5 HP: 86.5%
3. Above 5 HP: 91%

G. Multispeed Motors: Variable torque.

1. For motors with 2:1 speed ratio, consequent pole, single winding.
2. For motors with other than 2:1 speed ratio, separate winding for each speed.

2.4 THREE-PHASE MOTORS USED WITH VFD:

A. Description: Additional requirements for three-phase motors used with variable frequency controllers (VFD).

B. Motors Used with Reduced-Voltage and Multispeed Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals in motor terminal box, suited to control method.

C. Motors Used with Variable Frequency Controllers:

1. Windings: Copper magnet wire with moisture-resistant insulation varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses produced by pulse-width modulated inverters.
2. Inverter-Duty Motors: Class F temperature rise; Class H insulation.

2.5 SHAFT GROUNDING RINGS

A. Description: Conductive microfiber shaft grounding ring.

1. Meet NEMA MG-1 requirements.
2. Factory installed whenever possible.

B. Basis of Design: AEGIS, model SGR.

C. Type: Minimum of two rows of circumferential fibers on solid ring or split ring.

D. Application Note: Provide on motors greater than 1 HP.

1. Motors less than 100 HP: Mount ring on either the drive end or non-drive end.
2. Motors 100 HP and above: Two shaft grounding rings, mounted on the drive end and the non-drive end.

2.6 ELECTRONICALLY COMMUTATED MOTORS:

A. Description: Brushless DC motor with built in speed and torque controls.

B. Rotor: Permanent magnet.

C. Circuitry: Programmable, manage commutation of stator to be always synchronous with rotor.

D. Multispeed Motors: Minimum turndown of 80%.

E. Efficiency: Minimum of 65%.

F. Bearings: Permanently lubricated, heavy duty ball bearings.

G. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install motors and accessories according to manufacturer's instructions.

B. Install securely on firm foundation. Mount ball bearing motors with shaft in any position.

3.2 SHAFT GROUNDING RINGS

A. Shaft grounding rings (SGR) shall be factory installed inside the motors by the manufacturer wherever possible. SGR's may be field installed by installing contractor subject to Engineer's approval. Provide AEGIS SGR Colloidal Silver Shaft Coating, or approved equal, on shafts prior to rings installation, per SGR manufacturer's recommendations, after first cleaning shafts.

B. Install and test SGR's in accordance with manufacturer's recommendations. Install the SGR so that the aluminum frame maintains an even clearance around the shaft. Conductive microfibers shall be in full circumferential contact with conductive metal surface of the shaft. Do not use thread lock to secure the mounting screws as it may compromise the conductive path to ground. If thread lock is required, use a small amount of EP2400 AEGIS Conductive Epoxy, or approved equal, to secure the screws in place.

C. Shafts shall be clean and free of any coatings, paint, or other nonconductive material (clean to bare metal). Depending upon the condition of the shaft, it may require using emery cloth or Scotch-Brite. If the shaft is visibly clean, a non-petroleum based solvent may be used to remove any residue. Check the conductivity of the shaft using an ohm meter. Ohms test: Place the positive and negative meter leads on the shaft at a place where the microfibers will contact the shaft. Each motor will have a different reading but in general one should have a maximum reading of less than 2 ohms. If the reading is higher, clean the shaft again and retest.

D. After motors with SGR are fully installed in the field (in equipment, assemblies, or individually), for both factory-installed-SGR and field-installed-SGR cases, test for a conductive path to ground using an Ohm meter. Place one probe on metal frame of SGR and one probe on motor frame. Motor must be grounded to common earth ground with variable frequency drive according to applicable standards. Verify that SGR installations and test readings comply with SGR manufacturer's requirements.

END OF SECTION

SECTION 230530 – EXCAVATION AND BACKFILL

PART 1 - GENERAL

1.1 SUMMARY

A. The Contractor shall do all excavating and trench work necessary for the complete installation, as shown on the Drawings, for piping underground or under the floors.

1.2 QUALITY ASSURANCE

A. Backfill under any Federal, State or Local Municipality highway or street shall be backfilled in compliance with all Federal, State and Local Municipalities Codes and Regulations. All material used for backfill under such highways and streets shall be inspected and approved by the governing Authority. Before any bituminous or concrete is placed over such fills, they shall be inspected and approved by the governing Authority.

B. This Contractor shall repair, to the original condition, all sidewalks, curb, gutter, fence, streets or highways damaged or taken up to install outside services.

PART 2 - PRODUCTS

2.1 BACKFILL MATERIALS

A. Backfill in trenches inside and under building shall be sand or gravel materials approved by the Architect/Engineer.

PART 3 - EXECUTION

3.1 EXCAVATION AND BACKFILLING

A. Bell holes shall be excavated to insure sewer pipe resting for its entire length upon the bottom of the trench. Banks of trenches shall be kept as nearly vertical as possible and, if required, shall be properly sheeted and braced. The pipe trenches outside the building, after the piping has been tested and approved, shall be backfilled with excavated materials free from large clods or stones, carefully deposited in layers of 6"-8" in thickness on both sides of the pipe and thoroughly and carefully rammed until enough fill has been placed to provide a cover of not less than one foot above the pipe. The balance of the fill shall be deposited in layers not to exceed 9" in thickness and compacted to the density Specified under Compaction.

B. All materials excavated shall be deposited on the side of the trenches beyond reach of slides. Excavated material shall not be piled where it will interfere with traffic or other trade's work. All earth taken from trenches shall be deposited as directed or removed from site, as directed by the Architect/Engineer.

C. No pipes or PVC conduit shall be bedded directly on rock, but shall be cushioned by a 6" layer of sand or as approved by the Architect/ Engineer.

D. Maintain excavation in good order and provide bracing where necessary to prevent caving, settlement, or damage. Provide necessary pumps, power, suction and discharge lines to keep all excavation free from standing water.

E. All excavations are to be completed in a workmanlike manner, level and smooth.

F. Backfill under concrete or bituminous slabs, curbs, streets, parking lots, driveways, sidewalks or any other concrete items shall be of coarse gravel or material approved by the Architect/Engineer. Water shall be used as necessary to insure proper compaction of fill.

3.2 CLEANING

A. All areas to be backfilled shall be thoroughly cleaned of all construction and other debris.

3.3 COMPACTION

A. Compaction shall be done in lifts as the backfill is deposited in layers as specified above.

B. Compaction shall be to % of Standard Proctor density as listed below:

1. Grassed areas: 85% of Standard Proctor.
2. Under pavements and walks: 90% of Standard Proctor.
3. Under building floor slabs: 95% of Standard Proctor.

C. Moisture content shall be within 2% to 3% optimum moisture as determined by ASTM D-698. Compaction density shall be as determined by ASTM D-698.

END OF SECTION

SECTION 230590 – TESTING ADJUSTING AND BALANCING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Balancing air systems.
2. Balancing hydronic piping systems.

B. The work covered by this Specification consists in furnishing all labor, engineering and test equipment required to adjust and balance the following:

1. New hydronic systems.
2. Existing hydronic systems.
3. New air distribution systems.
4. Existing air distribution systems.

C. The TAB Contractor shall be subcontractor of Division 23 Contractor.

1.2 DEFINITIONS

A. Acronyms used in the specification are as follows:

1. AABC: Associated Air Balance Council.
2. NEBB: National Environmental Balancing Bureau.
3. TAB: Testing, adjusting, and balancing.
4. TABB: Testing, Adjusting, and Balancing Bureau.
5. TAB Specialist: An entity engaged to perform TAB Work.

1.3 SUBMITTALS

A. Submit Certified TAB reports to the Engineer.

1. Format: PDF preferred; provide three copies if paper.
2. Certification: By AABC or NEBB.

1.4 PROJECT CONDITIONS

A. Partial Owner Occupancy: Owner may occupy tenant leased areas of building before completion of test and balance. Cooperate with Tenants during TAB operations to minimize conflicts with tenant's operations.

1.5 QUALITY ASSURANCE

A. Division 23 Contractor shall employ an independent TAB Contractor specializing in total system air and hydronic testing and balancing.

1. All personnel involved in the execution of the work under the TAB Contract shall be experienced and factory-trained specifically in the total balancing of mechanical systems, as well as being regular employees of the TAB Contractor.
    a. TAB Technician: Employee of the TAB contractor and certified by AABC, NEBB, or TABB.

B. The following contractors have been pre-approved to bid the TAB work:

1. Air Dynamics; Granville, ND.
2. Balancing Professionals; Fargo, ND.
3. CL Linfoot; Grand Forks, ND.

4. Design Control, Inc.; Fargo, ND.
5. McFarlane, Inc.; Grand Forks, ND.
6. Mechanical Data; Wayzata, MN.
7. Statera Technical Services; Billings, MT.

C. Calibrate all instruments and provide verification of calibration provided with submittal data.

1.6 WARRANTY

A. The TAB agency shall provide an extended 90-day warranty after the completion of the TAB work, during which time the Owner or Engineer can request a rebalancing and retesting of any component listed in the report. The TAB agency shall provide a technician to assist the Owner and/or Engineer in making any tests they may require during this time period.

PART 2 - PRODUCTS (N/A)

PART 3 - EXECUTION

3.1 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance", ASHRAE 111, NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems", or SMACNA's "HVAC Systems - Testing, Adjusting, and Balancing" and in this Section.

B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.

1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts. Rubber or metal snap-in plugs are also acceptable.
2. Install and join new insulation that matches removed materials.

C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.

D. Verify interlocked systems are operating in conjunction.

E. Take and report testing and balancing measurements in inch-pound (IP) units.

F. Report deficiencies discovered before and during performance of testing, adjusting and balancing procedures.

G. Provide assistance to mechanical contractor to troubleshoot systems with deficiencies outside the allowable limits set in this Specification.

H. If initial TAB is not performed during near peak summer and winter conditions, perform additional TAB during peak summer and winter conditions.

3.2 REQUIREMENTS FOR AIR SYSTEMS

A. System Diagrams: Include schematic layouts of air distribution systems. Present each system with minimum single-line diagram.

B. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer. Record RPM and full load amperes.

1. Measure total airflow in main supply ducts. Where sufficient space in ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow.

C. Adjust all supply and exhaust zones to design CFM.

D. All main supply, return, exhaust and outside air ducts shall have a pitot tube traverse performed for accurate airflow performance. Identify the best locations in ducts for accurate duct airflow measurements.

E. Test and adjust each diffuser, grille and register to within tolerance requirements and also adjust so as to minimize drafts in all areas.

F. Test and adjust all fresh air quantities to individual heat pumps.

G. Verify that thermostats and humidistats are located to avoid adverse effects of sunlight, drafts, and heat generating appliances.

3.3 REQUIREMENTS FOR HYDRONIC SYSTEMS

A. Prepare hydronic systems for testing and balancing according to the following:

1. Open all manual valves for maximum flow.
2. Open all flow-control valves.
3. Set system controls so all automatic valves are wide open.
4. Check air vents for a forceful liquid flow exiting from vents when manually operated.

B. Measure and record water flow and pressure at pumps.

1. Verify pump-motor brake horsepower. Report when actual amperage exceeds nameplate amperage.
2. Check system resistance. With all valves open, read pressure differential across the pump and mark pump manufacturer's head-capacity curve.
3. Check pump-motor load. If motor is overloaded, throttle main flow-balancing devices so motor nameplate rating is not exceeded.
4. Record suction pressure and discharge pressure.

C. Measure flow at all automatic flow control valves to verify that valves are functioning as designed.

D. Measure flow at all pressure-independent characterized control valves, with valves in fully open position, to verify that valves are functioning as designed.

E. Check hydronic coils for clean and straight fins and correct piping connections.

F. Check air vents at coils and high points of the water system and verify all are installed and operating freely.

G. Verify strainers have been flushed until free of all sediment.

H. Verify that startup screens are replaced by permanent screens with indicated perforations.

I. Measure and record flow at all balancing devices to design flow tolerance.

3.4 PROCEDURES FOR TESTING, ADJUSTING, AND BALANCING EXISTING SYSTEMS

A. Perform an inspection of existing equipment that is to remain and be reused.

1. Measure and record the operating speed, airflow, and static pressure of each fan.
2. Measure motor voltage and amperage. Compare the values to motor nameplate information.
3. Report on the operating condition of the equipment and the results of the measurements taken. Report deficiencies.

B. Perform testing and balancing of existing systems to the extent that existing systems are affected by the renovation work.

1. Compare the indicated airflow of the renovated work to the measured fan airflows.
2. If calculations increase or decrease the air flow rates and water flow rates by more than 5 percent, make equipment adjustments to achieve the calculated rates. If increase or decrease is 5 percent or less, equipment adjustments are not required.
3. Balance each air outlet.

3.5 VARIABLE FREQUENCY DRIVES

A. VFD's on Belt-drive Fans: Sheave fan as required to attain the design airflow with the VFD set at 60 Hz. Fan VFD shall not be used to balance the airflow.

B. VFD's on Hydronic Pumps: Use VFD to balance the waterflow.

3.6 TOLERANCES

A. Set HVAC system airflow and water flow rates within the following tolerances:

1. Supply, Return, and Exhaust Fans: +5% to -5%
2. Air Outlets and Inlets: +10% to -10%
3. Heating/Cooling Water Flow Rate: +10% to -10%

3.7 FINAL REPORT GENERAL

A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.

1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
2. Include a list of instruments used for procedures, along with proof of calibration.

B. General Report Data: In addition to form titles and entries, include the following data:

1. Title page.
2. Name and address of the TAB contractor.
3. Project name.
4. Project location.
5. Architect's name and address.
6. Engineer's name and address.
7. Contractor's name and address.
8. Report date.
9. Signature of TAB supervisor who certifies the report.
10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
11. Summary of contents including the following:
    a. Indicated versus final performance.
    b. Deviation of final performance from design as percentage.
    c. Notable characteristics of systems.
    d. Description of system operation sequence if it varies from the Contract Documents.
12. Notes to explain why certain final data in the body of reports vary from indicated values.

3.8 FINAL REPORT RECORDED DATA

A. Motors:

1. Manufacturer.

2. Model or Serial Number.
3. Rated and measured Amperage and Voltage.
4. Rated Horsepower.
5. Rated and measured RPM.
6. Sheave Size, Type and Manufacturer.

B. Fans:

1. Manufacturer.
2. Model or Serial Number.
3. Design and measured CFM.
4. Design and measured RPM.
5. Design and measured Pressures.
6. Pulley Sheave Size, Type and Manufacturer.
7. Belt Size and Quantity.

C. Pumps (new larger motor and VFDs on heat pump building loop):

1. Manufacturer.
2. Model or Serial Number.
3. Design and measured GPM.
4. Design and operating Head.
5. Suction and discharge pressure.

D. Expansion Tanks:

1. Static water pressure.

E. Air Systems:

1. For each air inlet and outlet.
    a. Reference Number/Mark and Location.
    b. Design and measured CFM.

F. Water balancing:

1. For each flow control device location as indicated on the Drawings.
    a. Manufacturer and Type.
    b. Design and measured Pressure Drop.
    c. Design and measured Flow Rate.

G. Heat Transfer Elements (Reheat Coils, Radiation, Unit Heaters, Cabinet Unit Heaters, Etc.):

1. Manufacturer and Type.
2. Design and measured Pressure Drop.
3. Design and measured Flow Rate.

H. Heating/Cooling Fluid:

1. Water

I. Heat Pump Fresh Air:

1. Design and measured CFM.

J. Packaged Energy Recovery Unit:

1. Manufacturer and Type
2. Design and measured Air Inlet and Outlet Temperatures
3. Design and measured Electric Heating Coil Inlet and Outlet Temperatures
4. Design and measured Fresh Air and Exhaust Air Pressure Drops

K. Existing Ventilation System:

1. Existing Joy Axivane supply and exhaust fans blow air through existing air heat exchanger and filter frames to ventilate all area except PSAP Suite which is ventilated by ERU-1.
2. Adjust fans to provide airflow listed at inlets and outs or run-outs to heat pumps.
    a. Design and measured CFM.
    b. Design and measured RPM.
    c. Design and measured Pressures.

END OF SECTION

SECTION 230700 – HVAC INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Duct Insulation.
2. Equipment Insulation.
3. Piping Insulation.

B. The work covered by this Specification consists in furnishing all labor, equipment, accessories and materials and in performing all operations necessary for the installation of all insulation for the HVAC systems, in strict accordance with Section 230700 of this Specification and applicable Drawings and subject to the terms and conditions of the Contract.

1.2 REFERENCE

A. Related work in Section 220700 “Plumbing Insulation.”

1.3 SUBMITTALS

A. Shop Drawings: For materials covered under this section as per Section 230500.

1. Product Data: Each type of insulation.

B. Operation and Maintenance Data: Per section 230500.

1. Product Data: Each type of thermal and fire-rated insulation systems.

1.4 QUALITY ASSURANCE

A. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.

1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

B. All insulation shall be installed in a workmanlike manner by skilled workmen regularly engaged in this type of work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Except in other Part 2 articles where noted, the following manufacturers are acceptable:

1. Owens-Corning Fiberglass.
2. Johns Manville.
3. Knauf Insulation.

B. All manufacturers are subject to compliance with requirements.

C. Provide products by one of the manufacturers specified or by prior approval.

2.2 COMMON INSULATION MATERIALS

A. Products shall not contain asbestos, lead, mercury, or mercury compounds.

B. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.

C. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.

2.3 INSULATION

A. Fiberglass Wrap: Glass fibers bonded with a thermosetting resin; FSK or ASJ Max jacket. Comply with ASTM C 553, Type II and ASTM C 1290, Type I and Type III.

B. Fiberglass Board: Glass fibers bonded with a thermosetting resin, semi-rigid; FSK or ASJ Max jacket. Comply with ASTM C 612, Type IA or Type IB.

C. Fiberglass, Preformed Pipe Insulation: Glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ.

2.4 INSULATION JACKETS

A. ASJ Max Jacket: Poly-encapsulated paper jacket; Factory applied shall comply with ASTM C1136, Type I, II, III, IV.

B. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; Factory applied shall comply with ASTM C1136, Type II.

C. Self-Adhesive Outdoor Jacket: 5-ply high strength composite, self-adhesive, 7-mil-thick, laminated vapor barrier and waterproofing membrane consisting of a rubberized bituminous resin on a crosslaminated polyethylene film covered with white or stucco-embossed aluminum-foil facing.

   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:
      a. Polyguard Products; Alumaguard series.
      b. Venture Tape; VentureClad series.

D. Aluminum Jacket: Comply with ASTM B 209, Alloy 3003, 3005, 3105, or 5005, Temper H-14; stucco embossed, 0.016” thick.

   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:
      a. Childers Brand, Specialty Construction Brands, Inc.
      b. Metal Jacketing Systems.

E. PVC Jacket: Comply with ASTM D1784, Class 16354-C. High impact resistant, UV resistant, minimum 0.030” thick.

2.5 INSULATING CEMENTS

A. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C 449.

2.6 SEALANTS

A. Joint Sealants: Permanently flexible, elastomeric sealant, compatible with insulation materials, jackets, and substrates.

2.7 MASTICS

A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.

2.8 TAPES

A. Tapes: Match jacket with compatible adhesive as recommended by jacket manufacturer.

B. ASJ Max Tape: Foil-face, vapor-retarder tape; complying with ASTM C 1136, 3 inches wide.

C. FSK Tape: Foil-face, vapor-retarder tape; complying with ASTM C 1136, 3 inches wide.

D. Aluminum-Foil Tape: Vapor-retarder tape, 2 inches wide.

E. PVC Tape: White vapor-retarder PVC tape, 2 inches wide.

2.9 SECUREMENTS

A. Self-Sticking-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:

1. Baseplate: Galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
2. Spindle: Copper- or zinc-coated, low-carbon steel, fully annealed, 0.106-inch-diameter shank, length to suit depth of insulation indicated.
3. Adhesive-backed base with a peel-off protective cover.

B. Staples: Outward-clinching insulation staples, nominal 3/4-inch-wide, stainless steel or Monel.

C. Wire: 12 gauge nickel-copper alloy or 14 gauge soft-annealed, stainless steel or 14 gauge soft-annealed, galvanized steel.

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of ducts and fittings.

B. Install multiple layers of insulation with longitudinal and end seams staggered.

C. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

D. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic. Install insulation continuously through hangers and around anchor attachments.

E. Install insulation with jackets as follows:

1. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip.
2. Overlap jacket longitudinal seams at least 1-1/2 inches. Staple laps with outward clinching staples along edge.
3. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.

4. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to duct flanges and fittings.

F. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

3.3 PENETRATIONS

A. Roof/Wall Penetrations: Install insulation continuously through roof/wall penetrations.

1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation above roof/wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside flashing at least 2 inches.
4. Seal jacket to roof flashing with flashing sealant.

B. Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

C. Fire-Rated Wall and Partition Penetrations:

1. Duct: Terminate insulation at fire damper sleeves for fire-rated wall and partition penetrations. Externally insulate damper sleeves to match adjacent insulation and overlap duct insulation at least 2 inches.
2. Pipe: Terminate insulation at fire-rated wall and partition penetrations.
3. See Specification Section 230510 for further Fire-Barrier Penetration requirements.

D. Floor Penetrations:

1. Duct: For penetrations through fire-rated assemblies, insulate with same procedure as with Fire-Rated Walls.
2. Pipe: Install insulation continuously through floor penetrations. Seal penetrations through fire-rated assemblies. Install insulation per UL Fire Stop System guidelines for pipe material and size.
3. See Specification Section 230510 for further Fire-Barrier Penetration requirements.

3.4 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.

B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:

1. Install with continuous thermal and vapor-retarder integrity unless otherwise indicated.
2. Insulate fittings and specialties using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
3. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic and reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
4. Stencil or label the outside insulation jacket of each union with the word "union."

C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at

these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

3.5 FIBERGLASS INSTALLATION

A. General Procedures:

1. Apply adhesives according to manufacturer's recommended coverage rates of duct and plenum surfaces.

B. Installation on Ducts and Plenums: Secure with adhesive and insulation pins.

1. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
2. Install pins on sides and bottom of horizontal ducts and sides of vertical ducts wider than 12 inches. Cover exposed pins and washers with tape matching insulation facing.
3. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier.

3.6 FIBERGLASS PREFORMED PIPE INSULATION INSTALLATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above-ambient surfaces, secure laps with outward-clinched staples at 6 inches o.c.
4. For insulation with factory-applied jackets on below-ambient surfaces, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

C. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.

3.7 FLEXIBLE ELASTOMERIC AND POLYOLEFIN FOR PIPE INSTALLATION

A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Fittings and Elbows:

1. Install mitered sections of pipe insulation.
2. Secure insulation materials and seal seams with manufacturer's recommended adhesive.

C. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed valve covers manufactured of same material as pipe insulation when available.
2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.

D. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.

3.8 INDOOR DUCT AND PLENUM SCHEDULE

A. Fiberglass wrap, with FSK jacket:

1. Supply-Air Ducts and Plenums in attics, concealed spaces and unconditioned spaces.
2. Exhaust-Air Ducts and Plenums between isolation damper and penetration of building exterior.
    a. Exception: Lined Exhaust-Air Duct from power roof ventilators.

B. Fiberglass board, welded board pins, with FSK facing and matching label-less FSK tape:

1. Outdoor-Air Duct and Plenums.
2. Ducts and Plenums in Mechanical Rooms.
    a. Provide one of the following additional means of sealing and cladding:
        i. Mastic-canvas-mastic.
        ii. Mastic-fiberglass scrim cloth-mastic.
        iii. Self-adhering, peel and stick, rubberized bitumen jacket.

C. Insulation not required:

1. Return-Air Duct and Plenums in conditioned spaces.
2. Supply-Air Ducts and Plenums in exposed, conditioned spaces.
3. Metal ducts with duct liner of sufficient thickness to comply with energy code and ASHRAE/IESNA 90.1.
4. Factory-insulated flexible ducts.
5. Factory-insulated plenums and casings.
6. Flexible connectors.
7. Vibration-control devices.
8. Factory-insulated access panels and doors.

D. Minimum Duct Insulation R-Values

1. Supply ducts, installed in unheated attics and exterior: R-8.
2. Supply ducts, installed in unconditioned spaces, ceiling plenums, and crawl spaces: R-6.
    a. Exception: Cooling only supply ducts: R-2.
3. Supply ducts, installed in attic with roof insulation: R-2.
4. Return ducts, installed in unheated attics: R-4.
5. Outside air ducts: R-12.

3.9 EQUIPMENT INSULATION SCHEDULE

A. Heating-Hot-Water Air-Separator Insulation: Fiberglass Board: 2 inches thick, with canvas and mastic.

3.10 PIPING INSULATION SCHEDULE

A. Indoor, Aboveground:

1. Heat Pump Water:
    a. Bare pipe.
2. Heating-Hot-Water Supply and Return, 200°F and Below: Fiberglass.

a. 1-1/4 inch diameter pipe and smaller: 1-1/2 inches thick, R-6 minimum.
b. 1-1/2 inch pipe diameter and larger, 2 inches thick, R-8 minimum.

B. Outdoor, Aboveground PVC Tower Supply and Return:

1. Insulation, ½" thick fiberglass to maintain shape of jacket.
2. Jackets:
   a. Self-adhesive Outdoor Jacket.
   b. Aluminum.

END OF SECTION

SECTION 230900 – HVAC DDC CONTROLS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. The Automatic Temperature Control (ATC) Company bidding this Section of Work shall be a Subcontractor to the Division 23 HVAC Contractor.

B. Furnish all labor, materials, equipment, and service necessary for a complete and operating Building Automation System (BAS), utilizing Direct Digital Controls (DDC) for energy management, equipment monitoring and control, and subsystems as defined in Project Documents. In general, all material and equipment used shall be standard components, regularly manufactured and available and not custom designed especially for this project.

C. Control system shall consist of sensors, indicators, actuators, final control elements, interface equipment, other apparatus, accessories, and software connected to distributed controllers.

D. System points lists included in the Documents are intended to show the desired alarm, monitoring, and control points. Add any control points necessary and as required to accomplish the sequence of operations.

E. See Section 230990 "Sequence of Operations for HVAC Controls" for requirements that relate to this Section.

F. Additional items of work:

1. This is an existing facility and will require interface with an existing control system and the existing host computer system.
2. Remove all controls related pneumatic tubing and electrical conduit that is not reused as part of the new direct digital control and monitoring system.
3. Patch holes in existing ductwork at removed sensors that are not reused, with sheet metal patches of equal gauge or heavier. Seal airtight with adhesive and then screwed or pop riveted to the ductwork.

1.2 DEFINITIONS

A. Acronyms used in this specification are as follows:

1. BAS: Building Automation System.
2. NAC: Network Area Controller.
3. ASC: Application Specific Controllers.
4. GUI: Graphical User Interface.
5. DDC: Direct Digital Controls.
6. OEM: Original Equipment Manufacturer.
7. VFD: Variable Frequency Drive.

1.3 DIVISION OF WORK

A. Following divisions of work are generally applicable unless otherwise noted.

B. ATC contractor provides:

1. All controllers, control devices, control panels, controller programming, controller programming software.
2. Control components for terminal heating and cooling units not supplied with factory-wired controls.

3. Software and programming of BAS, GUI, development of all graphical screens, setup of schedules, logs and alarms, network management, global supervisory control applications, system integration and coordination and connection of the NAC to the local or wide area network.
4. BAS and Temperature Control wiring for a complete and operable system. All wiring shall be done in accordance with Division 26 of the specification and all local and national codes.

C. Products furnished by ATC contractor for installation by the Mechanical contractor:

1. Control valves.
2. Control dampers.
3. Wells for hydronic temperature sensors.
4. Static and differential pressure sensors for piping systems.

D. Products provided by Mechanical contractor:

1. Balancing dampers.

E. Electrical contractor provides, in accordance with Division 26 and Division 28:

1. Providing motor starters and disconnect switches.
2. Power wiring and conduit.
3. Provision, installation and wiring of smoke detectors.

1.4 SUBMITTALS

A. Shop Drawings shall be submitted on the equipment covered under this section as per Section 230500.

1. Schematic flow diagrams.
2. Power, signal, and control wiring diagrams.
3. Details of control panel faces.
4. Input devices.
5. Damper schedule.
6. Valve schedule.
7. DDC System Hardware: Wiring diagrams, schematic floor plans, and schematic control diagrams.
8. Control System Software: Schematic diagrams, written descriptions, and points list.

B. Operation and Maintenance Manuals: For system covered under this section as per Section 230500.

1.5 JOB CONDITIONS

A. Cooperation with Other Trades: Coordinate the Work of this section with that of other sections to insure that the Work will be carried out in an orderly fashion. It shall be this Contractor's responsibility to check the Contract Documents for possible conflicts between his Work and that of other crafts in equipment location, pipe, duct and conduit runs, electrical outlets and fixtures, air diffusers, and structural and architectural features.

1.6 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. All products of the BAS shall be provided with the Agency and Code Approvals: following agency approvals. Verification that the approvals exist for all submitted products shall be provided with the submittal package. Systems or products not currently offering the following approvals are not acceptable.

1. UL-916; Energy Management Systems
2. ULC; UL - Canadian Standards Association
3. FCC, Part 15, Subpart J, Class A Computing Devices

C. Any wireless devices that fail, shall be wired or replaced with a wired device at no additional cost to the owner.

1.7 WARRANTY

A. All systems and components shall be guaranteed against defects in material, workmanship and installation for a period of one year after completion. The guarantee period shall start after final owner instruction and system certification of system operation.

PART 2 - PRODUCTS

2.1 BUILDING AUTOMATION SYSTEM (BAS)

A. Manufacturers: Subject to compliance with requirements, the BAS shall be an extension of existing system manufactured by the following:

1. TCS Basys

B. Upgrade the existing BAS system to the latest software version that the existing equipment is capable of handling.

C. BAS shall be comprised of a network of interoperable, stand-alone digital controllers, a computer system, graphical user interface software, network devices and other devices as specified herein.

1. Network Area Controller: Manage the Energy and Building Management capabilities of the automation system as well as facilitate remote communications and central monitoring.
2. Application Controllers: Provide distributed, engineered control to the mechanical equipment specified, capable of stand-alone operation.
3. The Data Communications: Allow data to be shared between the various controllers in the architecture.
4. System Software: Include system software and site licenses for global application functions, application software for distributed controllers, and operator interface software.
5. End devices such as sensors, actuators, dampers, valves, and relays.
6. The failure of any single component shall not interrupt the control strategies of other operational devices. System expansion shall be through the addition of end devices, controllers, and other devices described in this specification.

D. System Accuracy and Display:

1. Space Temperature Accuracy: +/- 0.5°F.
2. Duct Temperature Accuracy: +/- 1°F.
3. Water Temperature Accuracy: +/- 1°F.
4. Pressure Accuracy: +/- 5% of range.
5. Airflow: +/- 4% of range; display to nearest 1 cfm.
6. Humidity Accuracy: +/- 3% RH.

2.2 USER ACCESS AND INTERFACE

A. User Access: Connect through the facility LAN and remotely.

1. Permit a minimum of 4 simultaneous users to access the system over the LAN.
2. Access level based on passwords.
    a. Appropriate levels of security (access) shall be maintained to insure the operability of the system.

b. Provide access for Engineer, owner, and temperature control contractor.

3. Capability to monitor parameters, change set points, view and set up trends, start/stop controlled equipment, modify calendars, view and acknowledge alarms.
   a. Remote user shall have this capability without having the system data base loaded on remote computer.

B. Remote Access: Include the capability for multiple users to access the BAS simultaneously from remote locations via standard Internet browsers without requiring proprietary operator interface and configuration programs.

C. User Graphical Interface: Dynamic animated color graphic displays.

1. Alarm Annunciation: Any point in a state of alarm shall change the color of its symbol to red until it is no longer in alarm.
2. Help System: Provide a context sensitive, on-line help system available for all applications with relevant data for that particular screen.
3. Existing Graphics: On projects where existing temperature control systems and graphics are being revised or added to the existing temperature control system, the following shall be provided:
   a. Update existing graphics with updated floor plan including changes and additions associated with this project.
   b. Graphics for existing equipment and floor plans shall be consistent with the format of the graphics for new equipment and floor plans.

2.3 ALARM MANAGEMENT

A. Alerts: Include a paging feature with telephone/email alerts to selected personnel for critical alarms as defined by Owner.

B. Alarm Management: Monitor, buffer, and direct alarm reports to operator devices.

C. Alarm Message: Include control point's English language description, time and date of occurrence, and purpose of alarm.

2.4 NETWORK AREA CONTROLLER

A. Control Units: Modular, comprising processor board with programmable, nonvolatile, random-access memory; integral interface equipment; and backup power source.

B. Units monitor or control each I/O point; process information; execute commands from other control units, devices, and operator stations; and download from or upload to operator workstation.

C. Stand-alone mode control functions operate regardless of network status.

D. This Contractor shall supply one or more NAC as part of this contract. Number of area controllers required is dependent on the type and quantity of devices.

2.5 APPLICATION CONTROLLERS

A. Local Control Units: Modular, comprising processor board with electronically programmable, nonvolatile, read-only memory; and backup power source.

1. Scheduling, alarming, trending, and network management received from NAC.

B. Units monitor or control each I/O point, process information, and download from or upload to operator workstation or diagnostic terminal unit.

1. Stand-alone mode control functions operate regardless of network status.
2. Battery backup for a minimum of 72 hours is also permissible.

C. Hardware: Suitable for anticipated ambient conditions.

2.6 CONTROL PANELS

A. Description: Wall-mounted, provide as required to contain all relays, terminal strips, power supplies and other equipment in the BAS.

B. Materials: UL listed, NEMA 1 minimum, 14 gauge steel minimum with stiffeners, continuous hinge doors. Panels may be constructed of structural plastic meeting UL and NEMA requirements.

C. Weatherproof: For control devices located in areas subject to outside weather conditions.

2.7 VARIABLE FREQUENCY DRIVES

A. Drives must comply with Section 230520 “Common Motor Requirements”, article “Variable Frequency Drives”. Additional requirements are listed in this article.

B. Description: Variable-frequency power converter factory packaged, listed and labeled; arranged to provide self-protection, protection, and variable-speed control of one or more three-phase induction motors by adjusting output voltage and frequency.

C. Integral Disconnect: NEMA 1, fusible switch with lockable, door-mounted handle.

1. Disconnect Rating: Not less than 115 percent of VFD input current rating.

D. Environmental Operating Conditions: 32°F to 104°F, 0 to 3,300 feet above sea level, less than 95% (non-condensing).

E. Controls and Indication:

1. Status Lights: Door-mounted LED indicators displaying Power on, Run, and Fault conditions.
2. Control Panel: Manufacturer's standard front-accessible, plain-English language digital display; allows programming, program copying, operating, monitoring, and diagnostic capability.
    a. Keypad: In addition to required programming and control keys, include keys for HAND, OFF, and AUTO modes.
3. Historical Logging Information and Displays:
    a. Running log of total power versus time.
    b. Total run time.
    c. Fault log, maintaining last 20 faults with time and date stamp for each.
4. Display VFD parameters including, but not limited to:
    a. Output frequency (Hz).
    b. Motor speed (rpm).
    c. Motor status (running, stop, fault).
    d. Motor current (amperes).
    e. Motor torque (percent).
    f. Fault or alarming status (code).
    g. PID feedback signal (percent).
    h. DC-link voltage (V dc).
    i. Set point frequency (Hz).
    j. Motor output voltage (V ac).

F. Building Electrical: 480 volts, 3 phase, 60 Hz.

G. Provide VFDs for following equipment:

1. (2) existing base-mounted pumps, 10 HP each.

2.8 ELECTRICAL DEVICES

A. Surge Protector: Provide; Diagnostic LED that indicates ground presence, system power and SPD function.

B. Relays: Indicator light.

C. Emergency shut-off switches

1. Description: Mushroom style boiler emergency shut-off.
2. Operator: Large, heavy duty, mushroom type; pull to reset.
3. Label: Indicate emergency boiler shut-down.

2.9 INPUT SENSORS

A. General Requirements: Installation, testing, and calibration of all sensors, transmitters, and other input devices shall be provided to meet the system requirements; vibration and corrosion resistant.

1. Wireless acceptable when sensor is readily accessible.
2. Wireless room temperature and humidity, and occupancy sensors are acceptable.

B. Temperature Sensors: Furnish in scale ranges compatible with system operating range.

1. Accuracy: Plus or minus 0.5°F at calibration point.
2. Room Sensors:
   a. Mounting: Surface or wallbox.
   b. Blank Plate Type: Sensing only.
   c. Integral Display Type: Wall mounting type with digital display showing simultaneous indication of space temperature and set-point in degree F. Allow local set-point adjustment of +/- 3°F from setpoint.
3. Outside-Air Sensors: Watertight inlet fitting, shielded from direct sunlight; minimum range -45°F to 120°F.
4. Duct Sensor:
   a. Insertion Elements: Single point, 8 inches long.
   b. Averaging Elements: 60 inches long, flexible.
5. Pipe Sensor: Thermistor type with 24” lead; strap on to pipe under insulation.
6. Liquid Sensor: Immersion elements with brass or stainless-steel socket, threaded for easy servicing.

C. Pressure Transmitters/Transducers:

1. Static-Pressure Transmitter: Nondirectional sensor with suitable range for expected input, and temperature compensated.
   a. Accuracy: 2% of full scale with repeatability of 0.5%.
   b. Building Static-Pressure Range: 0 to 0.25 inch wg.
   c. Duct Static-Pressure Range: 0 to 5 inches wg.
2. Water Pressure Transducers: Stainless-steel diaphragm construction; minimum 150-psig operating pressure.
3. Water Differential-Pressure Transducers: Stainless-steel diaphragm construction; minimum 150-psig operating pressure and tested to 300-psig.
4. Differential-Pressure Switch (Air or Water): Snap acting, with pilot-duty rating and with suitable scale range and differential.

D. Air and Water Flow Proof Devices: Solid state, adjustable, current operated relays with LED indicator.

1. Pressure differential switches are acceptable.

E. Air Flow Measuring Devices: Capable of continuous measurement of air volume.

1. Single or multiple airflow elements, factory mounted and pre-piped in casing designed for connection to ductwork. Multiple elements shall be manifolded together.
2. Probes shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds.
3. Traverse probes shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish with galvanized steel mounting hardware and shall not significantly impact fan performance or contribute to fan generated noise levels.
4. Performance: +/- 5% of reading, calibrated for suitable air velocity.

F. Air Filter Switches: Differential pressure switches, automatic reset.

1. Provide appropriate scale range and differential adjustment for intended service.

G. Air Pressure Safety Switches: Manual reset with appropriate scale range and differential adjustment for intended service.

H. Damper Position Indication: Electric switch type on two-position dampers to indicate fully open and fully closed. Provide where proof of position is required in sequence of operations.

2.10 OUTPUT DEVICES

A. Damper and Valve Actuators:

1. Electric Motors: Size to operate with sufficient reserve power to provide smooth modulating action or two-position action.
   a. Comply with requirements in Section 230520 "Common Motor Requirements."
   b. Permanent Split-Capacitor or Shaded-Pole Type: Gear trains completely oil immersed and sealed. Equip spring-return motors with integral spiral-spring mechanism in housings designed for easy removal for service or adjustment of limit switches, auxiliary switches, or feedback potentiometer.

2. Electronic Actuators: Direct-coupled type designed for minimum 60,000 full-stroke cycles at rated torque.
   a. Overload Protection: Electronic overload or digital rotation-sensing circuitry.
   b. Fail-Safe Operation: Mechanical, spring-return mechanism at locations with freeze potential. Fail last position otherwise. Provide external, manual gear release on nonspring-return actuators.

B. Control Valves: Factory fabricated, of type, body material, and pressure class based on maximum pressure and temperature rating of piping system, unless otherwise indicated.

1. Terminal Unit Control Valves: Characterized ball, forged brass body, stainless steel trim, two- or three-port as indicated, replaceable plugs and seats, union and threaded ends.
   a. Rating: Class 125 for service at 125 psig and 250°F operating conditions. Valves in plenums shall be rated for plenum use.
   b. Sizing: 3-psig maximum pressure drop at design flow rate, to close against pump shutoff head, not less than one-half the line size.

2. Globe Valves 2 inches and Smaller: Bronze body, bronze trim, rising stem, renewable composition disc, and screwed ends with backseating capacity repackable under pressure.
3. Globe Valves 2-1/2 inches and Larger: Iron body, bronze trim, rising stem, plug-type disc, flanged ends, and renewable seat and disc.
4. Hydronic system globe valves shall have the following characteristics:
   a. Rating: Pressure class based on maximum pressure and temperature rating of piping system.
   b. Internal Construction: Replaceable plugs and seats of stainless steel or brass.
   c. Sizing: 3-psig maximum pressure drop at design flow rate.

d. Flow Characteristics: Two-way valves shall have equal percentage characteristics; three-way valves shall have linear characteristics. Operators shall close valves against pump shutoff head.

5. Butterfly Valves: 200-psig, 150-psig maximum pressure differential, ASTM A 126 cast-iron or ASTM A 536 ductile-iron body and bonnet, extended neck, stainless-steel stem, field-replaceable EPDM or Buna N sleeve and stem seals.
   a. Disc Type: Nickel-plated ductile iron or Aluminum bronze.
   b. Sizing: 5-psig maximum pressure drop at design flow rate.

C. Control Dampers: AMCA-rated; tight closing, low leakage.

1. Bearings: Stainless steel or oil-impregnated bonze.
2. Damper Blades: Minimum 16 ga. galvanized steel or aluminum; maximum 6" width; maximum 48" length.
3. Blade Construction: One piece rolled with exposed or concealed linkage for face velocities of 1500 FPM or below; Airfoil type with double skin construction and linkage out of airstream for face velocities above 1500 FPM.
4. Damper Frames: Minimum 16 ga. galvanized steel or aluminum; provide stiffening or bracing for any section exceeding 48" in height.
5. Edge Seals: Closed-cell elastomeric on blades, flexible stainless steel on sides.
6. Opposed Blade Dampers: Use for throttling airflow.
7. Parallel Blade Dampers: Use for two position, open/close control.
8. Smoke Control Dampers: UL 555 listed.

D. Control Relays: modular plug-in design with retaining springs or clips.

1. Integral indicator light and check button.

PART 3 - EXECUTION

3.1 CONTROL PANEL INSTALLATION

A. Locations shown on the drawings are recommended locations and do not indicate actual quantity or location. Generally, locate all panels in mechanical and electrical rooms. Control panels will not be installed in public areas unless otherwise noted. Control panels will not be recessed installed on an exterior wall where condensation can accumulate in panel.

B. All control devices located in exposed areas subject to outside weather conditions shall be mounted inside weatherproof enclosures. Location of each panel shall be convenient for adjustment service.

C. Engraved nameplates shall be provided beneath each panel face mounted control device describing the function of each device.

D. All electrical devices within the panel shall pre-wired to terminal strips with all inter-device wiring within the panel completed prior to installation of the system.

E. The control panel in the lower-level boiler room will be powered by the emergency generator. Run all wiring for all boiler room equipment and PSAP equipment to this panel.

3.2 VFD INSTALLATION

A. Wall-Mounting Controllers: Install VFDs on walls with tops at uniform height and with disconnect operating handles not higher than 79 inches above finished floor unless otherwise indicated, and by bolting units to wall or mounting on lightweight structural-steel channels bolted to wall.

B. VFD by Others: Coordinate with the VFD manufacturer to provide a functional data communications connection. The BAS system shall include appropriate hardware equipment and software to allow two-way data communications between the BAS system and the VFD manufacturer's control panel.

1. All data supported by the VFD communication protocol shall be mapped into the supervisory DDC controller's database and shall be displayed on data screens at the Operator Workstation and shall be transparent to the operator.
2. Furnish a BACnet communications interface as required by the VFD manufacturer.

3.3 EMERGENCY SWITCH INSTALLATION

A. Install boiler emergency switches near boiler room exit doors and where shown on the Drawings. Attach label.

3.4 INPUT SENSOR INSTALLATION

A. Verify location of thermostats, humidistats, and other exposed control sensors with Drawings and room details before installation. Install devices with display approximately 48 inches above the floor; devices without display approximately same height as light switches. Provide one sensor for each zone of control.

B. Mount duct mount sensors in an electrical box through a hole in the duct and position to be easily accessible for repair or replacement.

C. Install averaging elements in ducts and plenums in crossing or zigzag pattern. Protect averaging or capillary tubes where they penetrate duct with rubber grommet and seal with clear silicon. Support with capillary clips and maintain minimum 1 inch tubing bending radius.

D. Install outside air sensors out of direct sunlight.

E. Differential pressure sensors used to control equipment such as fans and pumps shall be connected directly to the same controller that controls the equipment to ensure the continued proper operation of the controlled equipment without dependence on the control network.

F. Calibrate current switches to show a positive run status only when the motor is operating under load. A motor running with a broken belt or coupling shall indicate a negative run status.

G. Airflow Station: Install grid array in ductwork where shown. Provide gasket between frame and duct. Install in accordance with manufacturer's instructions.

H. Water Flow Meters: Install in accordance with manufacturer's instructions, with sufficient upstream and downstream straight pipe to obtain accurate readings.

I. Mount low temperature limit switches horizontally across duct in accordance with manufacturers recommended installation procedures. For large duct areas where the sensing element does not provide full coverage of the air stream, additional switches shall be provided as required to provide full protection of the air stream.

3.5 OUTPUT DEVICES INSTALLATION

A. Install damper motors on outside of duct in warm areas, not in locations exposed to outdoor temperatures.

B. All instrument wells, valves, and dampers are furnished by Controls Contractor and installed by the Division 23 contractor.

3.6 IDENTIFICATION

A. Major Equipment: Provide label with associated DDC point name. Major equipment includes all mechanical equipment scheduled on the Drawings.

B. DDC Control Panels: Provide label with ATC name, "Prairie Engineering, P.C.".

C. Misc. Switches or Other Special Function Devices: Provide phenolic labels with indication of device function or as directed on the Drawings.

D. Room Sensors: No label.

3.7 ELECTRICAL WIRING AND CONNECTION INSTALLATION

A. Install raceways, boxes, and cabinets according to Division 26.

B. Install building wire and cable according to Division 26.

C. Install signal and communication cable according to Division 27.

D. All junction boxes, junction box covers and raceway systems except those embedded directly in earth or concrete, or surface metal raceway systems (wiremold), shall be externally identified by permanent bright blue paint suitable for the purpose, to easily distinguish from other communication or power raceway systems. Items shall be painted prior to installation. In addition to field painted conduit, factory painted conduit as manufactured by Allied Tube & Conduit (Data Com Blue Steel EMT), acceptable.

E. Provide conduit where cables are concealed in walls, in mechanical rooms, and in rooms without ceilings.

1. All control wiring in exposed, accessible or in inaccessible areas in Nursing Home, Patient Care and Hospital facilities, and Dormitories with an occupancy of 16 people or greater shall be run in conduit.

F. Bundle and harness exposed multiconductor instrument cable in place of single cables where several cables follow a common path.

G. Fasten flexible conductors, bridging cabinets and doors, along hinge side; protect against abrasion. Tie and support conductors.

H. Number-code or color-code conductors for future identification and service of control system, except local individual room control cables.

I. Install wire and cable with sufficient slack and flexible connections to allow for vibration of piping and equipment.

J. Connect manual-reset limit controls independent of manual-control switch positions. Automatic duct heater resets may be connected in interlock circuit of power controllers.

K. Connect hand-off-auto selector switches to override automatic interlock controls when switch is in hand position.

L. The Temperature Control Contractor shall provide any line voltage wiring required for local or central control panels. Power may be extended from the nearest receptacle circuit or spare circuit breaker in nearest normal power panel.

M. The Division 26 Contractor shall furnish all power wiring to electrical starters and motors.

3.8 TREND LOGS

A. Prepare trend logs for all points required to show system calibration and stability.

B. These logs shall document building operation after the installation, balancing and calibration is completed and after the control system is fully operational.

3.9 CLEANING

A. Remove all protective labels and coverings from room sensors.

3.10 FIELD QUALITY CONTROL

A. Perform all necessary calibration, testing and de-bugging, and perform all required operational checks to insure that the system is functioning in full accordance with these specifications.

B. Demonstrate complete and proper operation of all systems per the Sequence of Operations to Engineer. The demonstration shall include, but not necessarily be limited to, the following:

1. Review of the trend logs.
2. Complete and proper operation of control systems including setpoints, valve positions, etc. shall be adjusted to artificially induce the sequences to occur.
3. Access to all devices for required maintenance.
4. Review of associated graphics on Host.
5. Identify and configure alarms.

C. Upon project completion provide oral operating and maintenance instruction to the owner's representative for a minimum of 8 hours during normal working hours. The contractor shall assist the owner in videotaping the instruction if they choose to do so. Instructions shall include:

1. A brief description of the controls' sequence of operation.
2. A discussion and explanation of all alarms, switches and gauges.
3. A summary and explanation of steps to be taken in response to specific alarms or control malfunctions.
4. Building walk-through to physically locate and examine all control devices and demonstrate control setpoint adjustment procedures.
5. Instructions regarding adjustment procedures shall emphasize methods for continual building "fine-tuning"

D. Provide written operating and maintenance instruction including a copy of each of the above-mentioned submittals, inspection and calibration frequency and cleaning methods with recommended cleaning materials. Provide 2 copies to the Engineer in 3-ring binders.

E. Satisfactory completion is when all required training and testing to show performance compliance with the requirements of the Contract Documents has been performed to the satisfaction of the Engineer. System acceptance shall be contingent upon completion and review of all corrected deficiencies.

3.11 DUCT SENSOR SCHEDULE

A. Insertion Elements:

1. Use where not affected by temperature stratification.
2. Ducts are smaller than 9 sq. ft.

B. Averaging Elements:

1. Use where prone to temperature stratification.
2. Ducts are larger than 9 sq. ft.
3. Inside air handling units.

END OF SECTION

SECTION 230990 – HVAC SEQUENCE OF OPERATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes control sequences for HVAC systems, subsystems, and equipment.

B. It is the intent of this specification to describe the HVAC control system. The intent shall be met by providing a complete and properly operating system as described by the specifications and detailed on the drawings. Equipment shall be furnished as required and shall include all incidental items necessary to meet the intent, even though not completely detailed herein.

C. See Section 230900 "HVAC Controls" for control equipment and devices and for submittal requirements

1.2 ABBREVIATIONS

A. The following abbreviations may be used in this specification.

1. ATC: Automatic temperature controls contractor.
2. BAS: Building automation system.
3. DAT: Discharge air temperature.
4. SAT: Supply air temperature.
5. RAT: Return air temperature.
6. OAT: Outdoor ambient temperature.
7. SWT: Supply water temperature.
8. RWT: Return water temperature.
9. CWS: Chilled water supply.
10. CWR: Chilled water return.
11. HPS: Heat pump supply water.
12. HPR: Heat pump return water.
13. VFD: Variable frequency drive.
14. Occ/Unocc: Occupied/Unoccupied.
15. Temp: Temperature.
16. User adj: User adjustable.

PART 2 - PRODUCTS (N/A)

PART 3 - EXECUTION

3.1 OCCUPIED/UNOCCUPIED MODE

A. Description: Method for setting occupied/unoccupied mode.

1. Provide: BAS schedule consisting of a 365 day calendar with 20 holidays, programmable by user.
2. Provide: Ceiling mounted room occupied sensors.

B. Occ/Unocc Mode Sequence: Monitor BAS schedule.

1. Condition: Schedule occupied. Action: Activate occupied mode.
2. Condition: Schedule unoccupied. Action: Activate unoccupied mode.

3.2 ALARM MANAGEMENT AND CONTROL

A. Alarm Annunciation: Provide page to display all alarms from all equipment for operator to check on regular basis.

1. Faults: Screen message text, email, pagers, graphic with flashing alarm objects, SMS texting, and/or other method selected by owner.
2. Problems: Screen message text, flashing graphic, and/or other method selected by owner.
3. Warnings: Flashing graphic on equipment page.

3.3 HYDRONIC SYSTEM PRESSURE

A. Description: Hydronic pressure monitoring.

1. Provide pressure sensor.

B. Emergency Pressure Sequence: Monitor hydronic system pressure.

1. Condition: System pressure below 5 psi. Action: Trigger alarm.
2. Condition: System pressure below 1 psi. Action: Trigger Fault alarm. Shut down boilers, chillers, pumps, and heat pumps as applicable.

C. User Interface Display:

1. System pressure.
2. Alarm.

3.4 TEST AND BALANCE

A. Description: Commands to facilitate test and balance procedure.

B. 2-way Control Valves: For each hydronic system.

1. Provide: Override command to open all control valves in a given hydronic system.

3.5 HEATING COILS, HYDRONIC

A. Description: Hydronic heating coil.

1. Provide: DAT sensor.
2. Provide: Normally open, 2-way modulating control valve.
3. Provide: Fail to last position, 2-way modulating control valve.

B. Temperature Setpoint Sequence: Monitor Occ/Unocc mode.

1. Condition: Occupied mode. Action: Zone set point to 72°F (user adj.), DAT to 70°F.
2. Condition: Unoccupied mode. Action: Zone set point to 65°F, user adj.

C. Control Valve Sequence: Monitor zone temp, DAT, and Occ/Unocc mode.

1. Condition: Zone at setpoint and occupied mode. Action: Modulate to maintain DAT setpoint.
2. Condition: Zone above setpoint. Action: Close.
3. Condition: Zone between 1°F and 3°F drop. Action: Modulate linearly from current position to 100% open.

D. Problem Alarm:

1. Condition: Zone temp 5°F (user adj.) below setpoint.

E. User Interface Display:

1. Space temperature: actual and set point.
2. DAT: actual and set point.
3. Occ/Unocc mode.
4. Control-valve position as percent open.

5. Alarms.
6. BAS system graphic.

3.6 HEATING COILS, ELECTRIC

A. Description: Factory wired duct heater with factory controls and low voltage terminal.

B. Heater Sequence: Monitor duct air temp.

1. Condition: 2°F below setpoint. Action: Activate heater.
2. Condition: 1°F above setpoint. Action: De-activate heater.

C. Problem Alarm:

1. Condition: Air temp 5°F (user adj.) below setpoint.

D. User Interface Display:

1. Zone Temp: actual and set point.
2. Occ/Unocc mode.
3. Heater operation status.
4. Alarms.

3.7 BOILERS

A. Description: Hydronic boilers with factory controls; boiler circulator pump.

1. Provide: Water temperature sensors as shown on Drawings.
2. Provide: Proof of flow for each pump.
3. Provide: Wiring to boiler controls for proof of flow and factory furnished sensors.
4. Provide: Boiler emergency kill switch at each boiler room exit.
5. Provide: Wiring from boiler circulator to boiler factory controls.
6. Provide: Capability to ignore problem zones for hot water reset.
7. Provide: Monitoring of low water level alarm.
8. Provide: Wiring as required for communication between boiler controllers.

B. Boiler Sequence: Monitor water temperature.

1. Hot Water Supply Temperature Setpoint: Maintained by boiler controls.

C. Alarm:

1. Problem Alarm: HWS temperature 15°F below setpoint.
2. Fault Alarm: Boiler lockout.
3. Fault Alarm: Low water level.
4. Fault Alarm: Building power failure.
5. Fault Alarm: Emergency Stop activated.

D. User Interface Display:

1. HWS temperature: actual and setpoint.
2. HWR temperature.
3. Boiler inlet and outlet temperatures per Drawings.
4. Boiler operation: command and proof.
5. Boiler circulator pump: command and proof.
6. Alarms.
7. BAS system graphics.

3.8 HEAT PUMP SUPPLY PUMPS

A. Description: Hydronic pumps, primary heat pump water circulators, lead/lag, variable speed operation based on differential pressure.

1. Provide: VFD; differential pressure sensors.

B. Pump Lead/Lag Status: Monitor BAS calendar, lead pump proof of operation.

1. Condition: Day one of month. Action: Alternate lead/lag pumps.
2. Condition: Lead pump fail. Action: Alternate lead/lag pumps, trigger Fault alarm.
3. Condition: Lead pump status change. Action: Activate new lead pump, deactivate new lag pump.

C. Lead Pump Sequence: Monitor differential pressure sensors, Occ/Unocc mode, all zone temps.

1. Condition: Occupied mode or any zone below setpoint. Action: Activate pump.
2. Condition: Unoccupied mode and all zones at or above setpoint. Action: Deactivate pump.
3. Condition: Differential pressure 1 psi below setpoint. Action: Increase pump speed.
4. Condition: Differential pressure 1 psi above setpoint. Action: Decrease pump speed.

D. Fault Alarms:

1. VFD fault status.
2. Lead pump fail.

E. User Interface Display:

1. Lead/Lag status.
2. Differential pressure: actual and setpoint.
3. Pump operation status.
4. Pump speed as percentage of minimum/maximum speed set by test and balance.
5. Alarms.
6. BAS system graphic.

3.9 HEAT PUMPS – WATER TO AIR WITH CONTROL VALVE

A. Description: Packaged water-to-air heat pump with factory control package and low voltage terminal.

1. Provide: Normally open, 2-position control valve.

B. Temperature Setpoint Sequence: Monitor Occ/Unocc mode.

1. Condition: 1 hour before occupied mode. Action: Zone heating setpoint to 71°F (user adj.) and cooling setpoint to 73°F (user adj.). Start commands to multiple heat pumps shall be staggered by 5 second intervals.
2. Condition: Unoccupied mode. Action: Zone heating setpoint to 70°F (user adj.) and cooling setpoint to 85°F (user adj.).

C. Supply Fan Sequence: Monitor Occ/Unocc mode, zone temp.

1. Condition: Occupied mode. Action: Activate fan.
2. Condition: Unoccupied mode and 2°F below setpoint. Action: Activate fan.
3. Condition: Unoccupied mode and above setpoint. Action: Deactivate fan.

D. Heating/Cooling Sequence: Monitor zone temp.

1. Condition: 2°F above setpoint. Action: Open control valve, 10 second delay, enable cooling.
2. Condition: 1°F below setpoint. Action: Open control valve, 10 second delay, enable heating.
3. Condition: Additional 1°F beyond setpoint. Action: Enable second stage heating/cooling (where applicable).

E. Alarms:

1. Fault Alarm: Heat pump alarm.
2. Problem Alarm: Zone 10°F beyond setpoint.

F. User Interface Display:

1. Zone Temp: actual and set point.
2. Occ/Unocc mode.
3. Heating/Cooling status.
4. Control-valve position.
5. Supply fan status.
6. Alarms.
7. BAS system graphic.

3.10 ENERGY RECOVERY UNIT

A. Description: Unit is air-to-air energy recovery with supply fan and exhaust fan. Energy recovery unit shall be equipped with factory controls and low voltage terminal strip.

1. Provide: Air temperature sensors for SA, RA, and EA.
2. Provide: Dirty filter sensors.

B. Supply Fan Sequence:

1. Condition: Normal operation. Action: Activate fan.

C. Exhaust Fan Sequence:

1. Condition: Normal operation. Action: Activate fan.

D. Alarms:

1. Fault Alarm: ERU not proven flow.
2. Warning Alarm: Dirty filters.

E. User Interface Display:

1. SAT, RAT, OAT, EAT.
2. Supply fan status: command and verification.
3. Exhaust fan status: command and verification.
4. Filter Normal/Dirty status.
5. Alarms.
6. Reset graphic.
7. BAS system graphic.

3.11 COOLING TOWER

A. Description: Unit is existing under base bid and replaced under alternate bid. Provide controls as required to duplicate existing operation.

3.12 WATER TREATMENT CONTROLLER

A. Description: Controller for existing automatic water treatment of cooling tower.

1. Provide: Wiring from factory provided flow switch, conductivity probe, pH probe, and ORP probe to controller.

END OF SECTION

SECTION 232000 – HVAC PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes:

1. Pipe and fitting materials, and joining methods for the following:
   a. Hot-water heating piping.
   b. Heat pump water piping.
   c. Cooling tower supply water piping.
   d. Cooling tower gravity “return to tank” water piping.
   e. Makeup-water piping.
   f. Condensate-drain piping.
   g. Natural gas piping.

1.2 REFERENCE

A. Refer to Section 230510 "Common Work Results For HVAC” for requirements of hangers, sleeves, sleeve seals, and escutcheons.

1.3 SUBMITTALS

A. Shop Drawings: For equipment covered under this section as per Section 230500.

1. Product Data: Provide a separate shop drawing for each of the following piping systems showing the material and fastening method chosen by the contractor:
   a. Aboveground hot-water heating.
   b. Heat pump water.
   c. Cooling tower supply water piping.
   d. Cooling tower gravity “return to tank” water piping.
   e. Makeup-water piping.
   f. Condensate drainage.
   g. Aboveground natural gas.

1.4 QUALITY ASSURANCE

A. All piping shall be installed in a workmanlike manner by skilled workmen regularly engaged in this type of work.

B. ASME Compliance: Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation. Safety valves and pressure vessels shall bear the appropriate ASME label. Fabricate and stamp air separators and expansion tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

PART 2 - PRODUCTS

2.1 COPPER TUBE AND FITTINGS

A. Hard Copper Tube: ASTM B 88, Type L and ASTM B 88, Type M water tube, drawn temper.

B. Soft Copper Tube: ASTM B 88, Type K, annealed temper.

C. Copper DWV Tube: ASTM B 306, drainage tube, drawn temper.

1. Copper Drainage Fittings: ASME B16.23, cast copper or ASME B16.29, wrought copper, solder-joint fittings.

D. Grooved-End Copper Fittings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:
   a. Anvil International, Inc.
   b. Victaulic Company.
2. Grooved-End Copper Fittings: ASTM B 75, copper tube or ASTM B 584, bronze casting.
3. Grooved-End-Tube Couplings: Rigid pattern, unless otherwise indicated; gasketed fitting. Ductile-iron housing with keys matching pipe and fitting grooves, EPDM gasket rated for minimum 230 °F for use with housing, and steel bolts and nuts.

E. Wrought-Copper, Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.

F. Cast-Copper, Solder-Joint Fittings: ASME B16.18, pressure fittings.

G. Copper Pressure-Seal Fittings: ASME B16.51, press-connect pressure fittings.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:
   a. Mueller Streamline Co.
   b. NIBCO, Inc.
   c. Viega, LLC.
2. Fittings for 2” and Smaller: Wrought-copper fitting with EPDM-rubber, O-ring seal in each end with leakage path feature to provide identification of un-pressed connections.
3. Fittings for 2-1/2” to 4”: Cast-bronze or wrought-copper fitting with EPDM-rubber, O-ring seal and stainless-steel grip ring in each end.

2.2 STEEL PIPE AND FITTINGS

A. Steel Pipe: ASTM A 53/A 53M, black steel with plain ends; type, grade, and wall thickness as indicated in Part 3 "Piping Applications" Article.

B. Cast-Iron Threaded Fittings: ASME B16.4; Classes as indicated in Part 3 "Piping Applications" Article.

C. Cast-Iron Pipe Flanges and Flanged Fittings: ASME B16.1, Classes 25, 125, and 250; raised ground face, as indicated in Part 3 "Piping Applications" Article.

D. Malleable-Iron Threaded Fittings: ASME B16.3, Classes 150 and 300 as indicated in Part 3 "Piping Applications" Article.

E. Malleable-Iron Unions: ASME B16.39; Classes 150, 250, and 300 as indicated in Part 3 "Piping Applications" Article.

F. Grooved Mechanical-Joint Fittings and Couplings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:
   a. Anvil International, Inc.
   b. Victaulic Company.
2. Joint Fittings: ASTM A 536, Grade 65-45-12 ductile iron; ASTM A 47/A 47M, Grade 32510 malleable iron; ASTM A 53/A 53M, Type F, E, or S, Grade B fabricated steel; or ASTM A 106, Grade B steel fittings with grooves or shoulders constructed to accept grooved-end couplings; with nuts, bolts, locking pin, locking toggle, or lugs to secure grooved pipe and fittings.

3. Couplings: Ductile- or malleable-iron housing and synthetic rubber gasket of central cavity pressure-responsive design; with nuts, bolts, locking pin, locking toggle, or lugs to secure grooved pipe and fittings.

G. Cold Press Mechanical-Joint Fittings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:
   a. Viega, LLC.
2. Fittings: Cold Press Mechanical Joint Fitting shall conform to material requirements of ASTM A420 or ASME B16.3 and performance criteria of ANSI/CSA LC4. Sealing elements for press fittings shall be EPDM. Sealing elements shall be factory installed or an alternative supplied by fitting manufacturer.
   a. Gas Fittings: Conform to material requirements of ASME B31.9 and performance criteria of ANSI/CSA LC4a/CSA 6.32a.

2.3 DIELECTRIC FITTINGS

A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.

B. Dielectric Nipple:

1. Comply with ASTM F1545.
2. Pressure Rating: 425 psi at 225°F.
3. Materials: Carbon steel body with crosslinked polyethylene (PEX) plastic insert.

C. Dielectric Unions:

1. Standard: ASSE 1079.
2. Pressure Rating: 125 psig minimum at 180 °F.
3. End Connections: Solder-joint copper alloy and threaded ferrous.

PART 3 - EXECUTION

3.1 PIPING INSTALLATIONS

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems.

B. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

C. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal. Exposed piping shall be run as high as possible except where noted otherwise.

D. Install piping to permit valve servicing and free of sags and bends.

E. Install press fittings with a minimum spacing of 1” between fittings.

F. Select system components with pressure rating equal to or greater than system operating pressure.

G. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.

H. Install drains, consisting of a tee fitting, 3/4” ball valve, and short 3/4” threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.

I. Install unions or flanges in piping, adjacent to valves, at final connections of equipment, and elsewhere as indicated.

J. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.

K. Install 3/4” nipple and ball valve in blowdown connection of strainers 2” and larger. Match size of strainer blowoff connection for strainers smaller than 2”.

L. Install escutcheons (chrome plates) for exposed piping penetrations of finished walls, ceilings, and floors.

3.2 GENERAL GAS PIPING INSTALLATION:

A. Sediment Traps: Install tee fitting with capped nipple in bottom to form drip, as close as practical to inlet of each appliance.

1. Construct sediment traps using tee fitting with bottom outlet plugged or capped. Use nipple a minimum length of 3 pipe diameters, but not less than 6 inches long and same size as connected pipe. Install with space below bottom of drip to remove plug or cap.

B. Extend relief vent connections for service regulators, line regulators, and overpressure protection devices to outdoors and terminate with weatherproof vent cap.

C. Connect branch piping from top or side of horizontal piping.

D. Install unions in pipes 2” and smaller, adjacent to each valve, at final connection to each piece of equipment.

E. Do not use natural-gas piping as grounding electrode.

F. Install strainer on inlet of each line-pressure regulator and automatic or electrically operated valve.

G. Install fittings for changes in direction and branch connections.

H. Install piping adjacent to appliances to allow service and maintenance of appliances.

I. Connect piping to appliances using manual gas shutoff valves and unions. Install valve within 72 inches of each gas-fired appliance and equipment. Install union between valve and appliances or equipment. Provide restraining cable from moveable appliances to wall.

3.3 NATURAL GAS PIPING INSTALLATION:

A. Comply with the International Fuel Gas Code for installation and purging of natural-gas piping.

B. Connect to regulator at gas meter. Prime and paint all exterior metal piping to protect from corrosion.

1. Clean piping to remove loose dirt and debris prior to applying primer. Sand any rust spots with 220-grit sandpaper; rinse pipe with water and allow to dry.
2. Apply metal primer paint to clean exterior piping.
3. Apply two coats of enamel-based metal topcoat paint. Allow the first coat to thoroughly dry before applying second coat.

C. All underground service piping to building and all meters and exterior regulators will be furnished and installed by the Utility Company and costs related to this service and meter installation are to be billed directly to the Owner by the Utility Company. It is the Division 23 Contractor’s responsibility to coordinate with Utility so the underground gas line is installed at the appropriate time during construction.

D. Install natural-gas piping electrically continuous and bonded to gas appliance equipment grounding conductor of the circuit powering the appliance according to NFPA 70.

3.4 HANGERS AND SUPPORTS

A. Install the following pipe attachments:

1. Adjustable steel clevis hangers for individual horizontal piping less than 50 feet long.
2. Adjustable roller hangers and spring hangers for individual horizontal piping 50 feet or longer.

3. Install trapeze hanger for multiple parallel piping 50 feet or longer.
4. Spring hangers to support vertical runs.
5. Provide copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.
6. On plastic pipe, install pads or cushions on bearing surfaces to prevent hanger from scratching pipe.
7. Install hanger 12” from elbow joint.

B. Install hangers for steel piping as follows:

1. 1” and smaller: 8 feet with 3/8-inch rod.
2. 1-1/4” to 3”: 10 feet with 3/8-inch rod.
3. 4” to 6”: 12 feet with 1/2-inch rod.
4. 8” and larger: 12 feet with 5/8-inch rod.

C. Install hangers for drawn-temper copper piping as follows:

1. 1-1/2” and smaller: 6 feet with 3/8-inch rod.
2. 2” to 4”: 10 feet with 3/8-inch rod.
3. 6” and larger: 10 feet with 1/2-inch rod.

3.5 PIPING APPLICATIONS

A. Piping materials are identified below. If more than one material is listed for an application, selection from materials listed is Contractor's option.

B. Hot-water heating and heat pump system piping, aboveground, 2” and smaller:

1. Type L or Type M, drawn-temper copper tubing; wrought-copper solder-joint fittings, or pressure-seal-joint fittings.
2. Schedule 40 steel pipe; Class 125, cast-iron fittings; cast-iron flanges and flange fittings; and threaded joints.
3. Schedule 40 steel pipe; Class 125, cold press mechanical-joint fittings.

C. Hot-water heating piping and heat pump system piping aboveground, 2-1/2” and larger:

1. Type L, drawn-temper copper tubing; wrought-copper solder-joint fittings, and copper pressure-seal-joint fittings for up to 4”.
2. Schedule 40 steel pipe, wrought-steel fittings and wrought-cast or forged-steel flanges and flange fittings, and welded and flanged joints.
3. Schedule 40 steel pipe; grooved, mechanical joint coupling and fittings; and grooved, mechanical joints.

D. Cooling Tower water piping (pumped), aboveground:

1. Schedule 40, hot-dipped galvanized steel piping.
2. Schedule 40 CPVC plastic pipe and fittings, and solvent-welded joints.
3. Schedule 40 PVC plastic pipe and fittings, and solvent-welded joints.

E. Cooling Tower water piping (gravity), aboveground:

1. Schedule 40 PVC plastic pipe with DWV fittings and solvent-welded joints.

F. Makeup-water piping installed aboveground:

1. Type L or Type M, drawn-temper copper tubing, wrought-copper fittings, and soldered joints.

G. Condensate-Drain Piping:

1. Type M, drawn-temper copper tubing, wrought-copper fittings, and soldered joints.

2. Schedule 40 PVC plastic pipe and fittings and solvent-welded joints. PVC not allowed in return air plenums.

H. Natural Gas Piping:

1. Aboveground: Black steel, Schedule 40, Type E or S, Grade B.
    a. Paint all exterior piping to prevent corrosion.
    b. Malleable-iron threaded fittings or wrought-steel welding fittings: 2” or smaller.
    c. Cold Press Mechanical-Joint Fittings:
        i. 2" or smaller.
        ii. Systems with gas pressure 5 psi and lower.
    d. Welded Fittings:
        i. Systems with gas pressure 2 psi and higher.
        ii. Piping larger than 2”.
        iii. Piping in inaccessible areas.
    e. Unions: Malleable iron with brass-to-iron seat, ground joint, and threaded ends.

END OF SECTION

SECTION 232100 – HYDRONIC SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes:

1. Chemical treatment.
2. Water flow control devices.
3. Air control devices.
4. Strainers.
5. Gauges (temperature, pressure).
6. Thermowells.
7. Gage attachments.

1.2 SUBMITTALS

A. Shop Drawings: For equipment covered under this section as per Section 230500.

1. Product Data: For each type of the following:
   a. Water Flow Control Devices.
   b. Air Control Devices.
   c. Strainers.
   d. Gauges.

B. Operation and Maintenance Manuals: For equipment covered under this section as per Section 230500.

1. Product Data: Flow control valves, gauges, and strainers.

1.3 QUALITY ASSURANCE

A. All equipment shall be installed in a workmanlike manner by skilled workmen regularly engaged in this type of work.

B. Motors: Comply with requirements in Section 230520 "General Motor Requirements."

1.4 GENERAL REQUIREMENTS AND SYSTEM DESCRIPTIONS

A. The New Hot Water Heating System shall be piped in to the existing heat pump building loop in an injection configuration and shall contain condensing boiler, strainer, and pump.

PART 2 - PRODUCTS

2.1 WATER FLOW CONTROL DEVICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Bell and Gossett
2. Flow Design, Inc.
3. Gerand Engineering Co.
4. Griswold Control Company
5. Hays Fluid Controls.
6. HCi (Hydronic Components Inc.)
7. Nexus Valve.

8. PRO Hydronic Specialties.
9. Tour & Andersson.

B. Balancing Valves – Autoflow Valve (adjustable):

1. Description: Brass Y-type automatic flow control and integral ball valve.
2. Basis of Design: Bell and Gossett Model Flo-Setter II.
3. Performance: ±5% Flow accuracy.
4. Rating: 375 psi at 250°F.
5. Flow Element: PA6 20# glass with stainless steel spring and HNBR diaphragm
6. Flow Verification: Provide pressure ports.
7. Ball Valve: Conform to Ball Valve specifications in this section.
8. Valve is to be capable of a range of adjustable flows as set by a dial or handle. The scheduled flow is intended to be near the middle of the range of flow for the balancing device.
9. A combination ball valve and strainer is required upstream of this device at all installation locations.

2.2 STRAINERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Armstrong International.
2. Bell & Gossett.
3. Metraflex Company (The).
4. O.C Keckley Company.
5. Titan Flow Control.
6. Victaulic.

B. Strainers

1. Body: Brass with threaded screen retainer for 2” and smaller; cast iron rated for 125 psig with bolted cover and bottom drain connection for 2-1/2” and larger.
2. End Connections: Threaded ends for 2” and smaller; flanged ends for 2-1/2” and larger.
3. Strainer Screen: 20-mesh brass or stainless steel for 2” and smaller; 3/64” perforated stainless steel for 2-1/2” and larger.
4. Include PT port when installed on a coil.

C. Combination Ball Valve / Strainers

1. Description: Combination wye strainer, full port shut-off valve and union.
2. Basis of Design: Bell & Gossett model UBY
3. Body: Brass.
4. Ball: Full Port Chrome Plated.
5. Ball Seal: PTFE.
6. Rating: 400 psig.
7. Stem: Stainless steel.
8. O-rings: EPDM.
9. Strainer: 20 mesh stainless steel.
10. Include PT port when installed on a coil.
11. End Connections: Threaded ends for 2” and smaller; flanged ends for 2-1/2” and larger, or as required by the contractors chosen installation methods.

2.3 GAUGES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Miljoco Corporation.
2. Trerice, H. O. Co.
3. Weiss Instruments, Inc.
4. WIKA Instrument Corporation - USA.
5. Winters Instruments - U.S.

B. Thermometers – 6” Industrial-Style, Liquid-in-Glass:

1. Basis of Design: Weiss Instruments model HW5A2.
2. Case: Plastic or cast aluminum; 6-inch nominal size.
3. Case Form: Adjustable angle.
4. Tube: Glass with magnifying lens and blue or red non-toxic liquid.
5. Tube Background: Permanent scale markings graduated in deg F.
6. Stem: Brass or Aluminum and of length to suit installation.

C. Thermometers – Digital:

1. Basis of Design: Trerice SX9 Solar Therm series.
2. Case: Hi-impact plastic or cast aluminum.
3. Case form: Adjustable angle.
4. Display: 1/2” LCD digits, wide ambient formula
5. Power Source: Integral solar cell.
6. Min/Max Feature: Button to recall minimum and maximum temperatures over a given period; resettable.

D. Pressure Gages – Dial Type:

1. Basis of Design: Weiss Instruments 4UG series.
2. Standard: Conform to ASME B40.100.
3. Case: Cast aluminum or drawn steel; 4-1/2-inch nominal diameter.
4. Pressure-Element Assembly: Bourdon tube
5. Movement: Mechanical, with link to pressure element and connection to pointer.
6. Dial: White aluminum with scale markings graduated in psi.
7. Scale: Select so expected pressure reading is in center of range.

E. Pressure Gages – Digital:

1. Basis of Design: Weiss Instruments DUGY3 Series.
2. Standard: Conform to ASME B40.100.
3. Case: Glass reinforced plastic; 4-1/2-inch nominal diameter.
4. Sensor: Gold-plated ceramic.
5. Wetted Materials: Stainless Steel.
6. Power: Solar cell.
7. Display: 5/8” high.
8. Accuracy: 0.5% full scale.
9. Ranges: Select so upper limit is two times expected average reading.
10. Ambient Operating: 10°F to 140°F.

F. Gauge Accessories:

1. Thermowells:
   a. Description: Pressure-tight, socket-type fitting made for insertion into piping tee fitting.
   b. Lagging Extension: Include on thermowells for insulated piping and tubing.
   c. Heat-Transfer Medium: Mixture of graphite and glycerin.
2. Snubbers: Brass; piston or porous-metal-type surge-dampening device. Include extension for use on insulated piping.
3. Siphons (Pigtail): Loop-shaped section of brass or steel pipe.

4. Valves: Brass ball, threaded.

PART 3 - EXECUTION

3.1 CHEMICAL TREATMENT INSTALLATION

A. Clean system as outlined in Section 230500.

B. Add initial chemical treatment and maintain water quality in ranges noted above for the first year of operation.

3.2 WATER FLOW CONTROL DEVICE INSTALLATION

A. Autoflow Valves: 2” and smaller piping where indicated on drawings. Provide combination ball valve and wye-type strainer upstream at all installation locations.

1. These are allowed for use in all terminal devices except air handler coils and branch piping.
2. Autoflow valves are to be furnished with an adjustable range, with the scheduled GPM intended to be the middle of that range.

B. Furnish with chained metal tag showing location, size, GPM, and meter reading.

3.3 AIR CONTROL DEVICE INSTALLATION

A. Install manual air vents on air chamber at the high point of all piping and in the return piping at all heating units. In coil installations, provide a PT port.

B. Provide valved drain and hose connection on strainer blow down connection.

3.4 GAUGE INSTALLATION

A. Install direct-mounted thermometers in thermowells and adjust vertical and tilted positions.

1. Install thermowells with extension on insulated piping.
2. Fill thermowells with heat-transfer medium.

B. Adjust faces of meters and gages to proper angle for best visibility.

C. Install valve and snubber in piping for each pressure gage for fluids (except steam).

D. Install valve and siphon fitting in piping for each pressure gage for steam.

3.5 HEATING AND COOLING FLUID SCHEDULE

A. Heating Fluid:

1. Boiler System: 100% water.

B. Cooling Tower Loop Fluid:

1. 100% water

C. Heat Pump Loop Fluid:

1. 100% water

3.6 THERMOMETER SCHEDULE

A. Install thermometers in the following locations:

1. Outlet of each hydronic boiler.
2. In heat pump building loop on each side of heating water injection connections.
3. Other as shown on the drawings.

B. Heating, Hot-Water Piping: 0 to 250°F.

C. Heat Pump Piping: 0 to 200°F.

3.7 PRESSURE GAUGE SCHEDULE

A. Install pressure gages in the following locations:

B. Scale Range for Hot Water Pump Gauges: 0 to 100 psi.

END OF SECTION

SECTION 232200 – HYDRONIC PUMPS AND SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hydronic pumps.
2. Condensate pump units.

1.2 REFERENCE

A. See Section 223000 “Plumbing Equipment” for domestic water pumps.

1.3 SUBMITTALS

A. Shop Drawings: For equipment covered under this section as per Section 230500.

1. Product Data: Include certified performance curves and rated capacities, operating characteristics, furnished specialties, final impeller dimensions, and accessories for each type of product indicated. Indicate pump's operating point on curves.

B. Operation and Maintenance Manuals: For equipment covered under this section as per Section 230500.

1.4 QUALITY ASSURANCE

A. Motors: Comply with requirements in Section 230520 "General Motor Requirements."

1.5 WARRANTY

A. Manufacturer's standard form in which manufacturer agrees to repair or replace components that fail in materials or workmanship within specified period.

1. Warranty Period: Not less than one year from the date of Substantial Completion.

1.6 EXTRA MATERIALS:

A. Provide one set of mechanical seals for each model type of new pump scheduled.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Except where otherwise noted, the following pump manufacturers are acceptable:

1. Armstrong Pumps Inc
2. Bell & Gossett; Div. of ITT Industries
3. Grundfos Pumps Corp.
4. Taco, Inc.
5. Thrush Company Inc.
6. Wilo USA LLC

B. All manufacturers are subject to compliance with requirements

C. Provide products by one of the manufacturers specified or by prior approval.

2.2 CAPACITIES AND CHARACTERISTICS

A. See schedules on the Drawings for pumps listed below.

B. Pump Ratings: 125-psig pressure and 220 °F temperature, unless otherwise indicated.

C. Pump Motors: Single speed and rigidly mounted to pump casing with permanently lubricated ball bearings, unless otherwise indicated.

1. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Comply with NEMA designation, temperature rating, service factor, and efficiency requirements for motors specified in Section 23 0520 “Common Motor Requirements.”
3. Enclosure: Open, dripproof.

2.3 IN-LINE PUMPS – CLOSE-COUPLED

A. Description: Factory-assembled and -tested, centrifugal, overhung-impeller, close-coupled, in-line pump; designed for installation with pump and motor shafts mounted horizontally or vertically.

B. Pump Construction:

1. Casing: Radially split, cast iron, with threaded gage tappings at inlet and outlet and threaded companion-flange connections.
2. Impeller: ASTM B 584, cast bronze; statically and dynamically balanced, keyed to shaft, and secured with a locking cap screw. For constant-speed pumps, trim impeller to match specified performance.
3. Pump Shaft: Steel, with copper-alloy shaft sleeve.
4. Seal: Mechanical seal consisting of carbon rotating ring against a ceramic seat held by a stainless-steel spring, and EPT bellows and gasket. Include water slinger on shaft between motor and seal.
5. Pump Bearings: Permanently lubricated ball bearings.

2.4 CONDENSATE PUMP UNITS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Little Giant Pump Co.

B. Description: Packaged units with corrosion-resistant pump, plastic tank with cover, and automatic controls. Include factory- or field-installed check valve and a 72-inch-minimum, electrical power cord with plug.

PART 3 - EXECUTION

3.1 PUMP INSTALLATION

A. Install pumps to provide access for periodic maintenance including removing motors, impellers, couplings, and accessories.

B. Independently support pumps and piping so weight of piping is not supported by pumps and weight of pumps is not supported by piping.

C. Automatic Condensate Pump Units: Install units for collecting condensate and extend to open drain.

D. Equipment Mounting: Install base-mounted pumps on cast-in-place concrete equipment bases. Refer to Division 03 for concrete requirements.

1. Coordinate sizes and locations of concrete bases with actual equipment provided.
2. Construct concrete bases 4 inches high and extend base not less than 6 inches in all directions beyond the maximum dimensions of base-mounted pumps unless otherwise indicated.

3.2 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install pressure gages on pump suction and discharge or at integral pressure-gage tapping, or install single gage with multiple-input selector valve.

END OF SECTION

SECTION 233000 – AIR DISTRIBUTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Ducts and fittings.
2. Sheet metal materials.
3. Sealants and gaskets.
4. Duct Liners.
5. Hangers and supports.
6. Dampers.
7. Life safety dampers.
8. Access doors.
9. Turning vanes.
10. Flexible ducts.

1.2 PERFORMANCE REQUIREMENTS

A. Delegated Duct Design: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in "Duct Schedule" Article.

1.3 SUBMITTALS

A. Shop Drawings: For equipment covered under this section as per Section 230500.

1. Round ducts and fittings: Materials, drawings of fittings with method of assembly.
2. Duct Liners: Make and model, performance, materials.
3. Dampers: Make and model, components, materials, drawings with dimensions and field connections.

4. Life safety dampers:
    a. Design Characteristics: Make and model, listings, ratings, components, controls.
    b. Physical Characteristics: Quantities, materials, drawings with dimensions and field connections.
    c. Electrical Characteristics: Power requirements, wiring diagrams.

B. Operation and Maintenance Manuals: For equipment where shop drawings were submitted this section as per Section 230500.

PART 2 - PRODUCTS

2.1 RECTANGULAR DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on 2” static-pressure class unless otherwise indicated.

B. Ductwork shall be fabricated in accordance with the following schedule:

1. Up to 12" Width: 26 Gauge
2. Up to 30" Width: 24 Gauge
3. Up to 60" Width: 22 Gauge

4. Up to 90" Width: 20 Gauge
5. 90” Width and Up: 18 Gauge

2.2 ROUND DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Fabricated Duct Systems
2. Norlock Metal Products, Inc.
3. SEMCO Incorporated.
4. Spiral Manufacturing Co., Inc.
5. Tangent Air, Inc.
6. United Sheet Metal

C. Ductwork shall be fabricated in accordance with the following schedule:

1. 3”-14" Diameter: 26 Gauge
2. 15”-26" Diameter: 24 Gauge
3. 28”-36" Diameter: 22 Gauge
4. 38”-50" Diameter: 20 Gauge
5. 52”-60" Diameter: 18 Gauge
6. 61”and Above: 16 Gauge

D. Transverse Joints in Ducts Larger Than 60 inches in Diameter: Flanged.

E. Fabricate round ducts larger than 90 inches in diameter with butt-welded longitudinal seams.

2.3 SHEET METAL MATERIALS

A. General Material Requirements: Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G60.
2. Finishes for Surfaces Exposed to View: Mill phosphatized, or primed with DTM (Direct to Metal) paint equivalent to Sherwin Williams B42W series.

C. Carbon-Steel Sheets: Comply with ASTM A 1008/A 1008M, with oiled, matte finish for exposed ducts.

D. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.

E. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.4 RECTANGULAR DUCT CONNECTION SYSTEM

A. Description: Roll-formed flanges, corner pieces, gasket and metal cleat.

1. Sealer: Integral mastic meeting NFPA 90A and 90B Class I requirements.
2. Gasket: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.
3. Schedule: Rectangular ductwork with perimeter greater than 120”.

2.5 SEALANT AND GASKETS

A. General Sealant and Gasket Requirements: Maximum flame-spread index of 25 and maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.

B. Two-Part Tape Sealing System:

1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
2. Tape Width: 4 inches.
3. Water resistant, mold and mildew resistant.
4. Maximum Static-Pressure Class: 6-inch wg, positive and negative.
5. Service: Indoor and outdoor.
6. Service Temperature: Minus 20 to plus 200 °F.
7. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.

C. Water-Based Joint and Seam Sealant (Mastic):

1. Application Method: Brush on.
2. Solids Content: Minimum 65 percent.
3. Water resistant, mold and mildew resistant.
4. Maximum Static-Pressure Class: 6-inch wg, positive and negative.
5. Service: Indoor or outdoor.
6. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

D. Flanged Joint Sealant: Comply with ASTM C 920.

1. General: Single-component, acid-curing, silicone, elastomeric.
2. Type S, grade NS, class 25, use O.

E. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

F. Round Duct Joint O-Ring Seals:

1. Seal shall provide maximum 3 cfm/100 sq. ft. at 1-inch wg and shall be rated for10-inch wg static-pressure class, positive or negative.

2.6 DUCT LINER

A. General Requirements:

1. Duct liner products shall conform to the requirements of ASTM C1071.
2. The manufacturers product identification shall appear on the air stream surface.
3. Duct liner adhesive shall conform to the requirements of ASTM C 916.
4. The finished duct system shall meet the requirements of NFPA 90A and 90B.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Owens-Corning Fiberglass
2. Johns Manville
3. Knauf Insulation.

C. Duct Liner: Composed of glass fibers firmly bonded together with a thermosetting resin overlaid with a tough and durable fire-resistant black composite surface on the air stream side.

1. Maximum flame-spread index of 25 and smoke-developed index of 50.
2. Water Vapor Sorption: Less than 3% by weight per ASTM C1104
3. Non-corrosive, bacterial resistant, mold and mildew resistant.

4. Operating Limits: Maximum 250 °F, maximum 6,000 fpm per UL 181.
5. Thickness and Density: 1/2” and 2.0 lbs/cf; 1” and 1.5 lbs/cf.

2.7 DAMPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Cesco Products; a division of Mestek, Inc.
2. Greenheck Fan Corporation.
3. NCA Manufacturing, Inc; Metal Industries, Inc.
4. Nailor Industries Inc.
5. Pottorff.
6. Ruskin Company.
7. Vent Products Company, Inc.

B. Backdraft Dampers - Rectangular:

1. Description: Gravity balanced.
2. Up to 2” wg. System Pressure:
   a. Frame: 0.125”-thick extruded aluminum.
   b. Blades: Multiple single-piece blades, maximum 6-inch width, 0.050”-thick aluminum with sealed edges.
3. Blade Action: Parallel.
4. Blade Seals: Felt or Vinyl foam for silent operation.
5. Blade Axles: Aluminum.
6. Accessories: Adjustment device to permit setting for varying differential static pressure.

C. Backdraft Dampers - Round:

1. Description: Spring operated. Suitable for vertical airflow, up or down; and horizontal airflow.
2. Frame: 20 ga. galvanized steel.
3. Blades: Multiple single-piece blades, galvanized steel.
4. Blade Seals: Closed cell neoprene foam for silent operation.
5. Blade Axles: Plated steel.

D. Manual Volume Dampers:

1. Standard, Galvanized Steel, Manual Volume Dampers:
   a. Suitable for horizontal or vertical applications.
   b. Single blade, or multiple, opposed-blade design.
2. Adjustable quadrants or regulators: Plainly marked to indicate position of damper, with locking nut.

E. Control Dampers:

1. Furnished under Section 230900, installed by Division 23 except where otherwise noted.

2.8 ACCESS DOORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Cesco Products; a division of Mestek, Inc.
2. Ductmate Industries, Inc.
3. Greenheck Fan Corporation.
4. MIFAB.
5. Nailor Industries Inc.

6. Ward Industries, Inc.; a division of Hart & Cooley, Inc.

B. Door: Foam gasket, galvanized sheet metal with 1" insulation fill.

1. Vision panel where noted in Access Door Installation article.
2. Hinges and Latches: Piano hinge and cam latches.
3. Size: 12"x12", unless otherwise noted.

C. Frame: Galvanized sheet steel, with foam gaskets.

2.9 TURNING VANES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Ductmate Industries, Inc.
2. SEMCO Incorporated.
3. Tuttle & Bailey.
4. Ward Industries, Inc.; a division of Hart & Cooley, Inc.

B. Manufactured Turning Vanes for Metal Ducts: Curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.

C. Manufactured Turning Vanes for Nonmetal Ducts: Fabricate curved blades of resin-bonded fiberglass with acrylic polymer coating; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.

2.10 VOLUME EXTRACTORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Krueger.
2. Nailor Industries.
3. Tuttle & Bailey.

B. Manufactured Volume Extractors: Gange operated, curved blades of galvanized sheet steel to extract air from main duct to stub duct.

1. Blad Spacing: 1".
2. Adjustment Type: Rod operator, external adjustment, with locking device.

2.11 HIGH EFFICIENCY TAKEOFF

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other equivalent:

1. Ductmate Industries, Inc.
2. Lukjan Metal Products.
3. Sheet Metal Connectors, Inc.

B. Manufactured to conform to SMACNA 2005 duct construction standards:

1. Material: Match duct material, minimum 24 gauge.
2. Body: 45° slope, rectangular opening transition to round.
3. Gasket: EPDM rubber
4. Damper: Minimum 24 gauge, manual volume damper.

2.12 FLEXIBLE DUCTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Flexmaster U.S.A., Inc.
2. McGill AirFlow LLC.
3. Thermaflex.
4. Ward Industries, Inc.; a division of Hart & Cooley, Inc.

B. Noninsulated, Flexible Duct: UL 181, Class 1, 2-ply vinyl film supported by helically wound, spring-steel wire.

1. Pressure Rating: 10-inch wg positive and 1.0-inch wg negative.
2. Maximum Air Velocity: 4000 fpm.
3. Used for ventilation only systems.

C. Insulated, Flexible Duct: UL 181, Class 1, aluminum laminate and polyester film with latex adhesive supported by helically wound, spring-steel wire; fibrous-glass insulation; aluminized vapor-barrier film.

1. Pressure Rating: 10-inch wg positive and 1.0-inch wg negative.
2. Maximum Air Velocity: 4000 fpm.
3. Insulation: Minimum R-3.5, except in attics: R-6.

D. Flexible Duct Connectors:

1. Clamps: Stainless-steel band with cadmium-plated hex screw to tighten band with a worm-gear action.

PART 3 - EXECUTION

3.1 DUCTWORK INSTALLATION

A. Ductwork shall be run as high as possible in all rooms to maintain proper headroom. Where two or more ducts cross each other, they must be arranged in such a manner as to maintain the greatest possible clearance underneath.

B. Ductwork shall not cover any electrical outlets or junction boxes. Consult with other trades to avoid interference with piping runs, etc.

C. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.

D. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.

E. Ducts shall conform to dimensions on the Drawings unless location of structural members prohibit. Make minor changes in run of certain ducts without extra cost to the Owner if necessary to avoid unforeseen structural or other interferences.

F. All ductwork, where internal insulation is to be applied, shall be increased in size so the net internal dimension is that indicated on the Drawings.

G. In case of a change in dimension, cross-sectional areas shall be maintained. Changes in size throughout shall be of perfect rectangular cross sections with a slope of approximately 1 to 4. Abrupt changes or offsets will not be accepted.

H. All ducts shall be straight and smooth on the inside with finished joints. No inside standing seams will be permitted in ductwork. No single thickness partitions shall be allowed between ducts. The Engineer reserves the right to order any open seams or joints made tight by caulking or taping. No open joints at corners or elsewhere will be allowed.

I. Where space permits, elbows shall have a centerline radius equal to 1½ times their width. Shorter radius and square throat elbows shall be used where required to fit restricted areas only and where required by the duct connection details on the Drawings. All short radius and square throat elbows shall be provided with turning vanes.

J. All vertical ducts or risers shall be self-supporting.

K. Watertight drip pans shall be provided below all power vent, relief vent, gravity vent, fresh air and exhaust openings through roof, either built into the ductwork or, if no duct is installed, independently suspended below opening. All fresh air, exhaust air and relief air louver plenums shall have watertight seams on bottom portion of plenums. All fresh air ductwork and other ductwork, as noted on the Plans, shall be caulked watertight.

3.2 DUCT SEALING

A. Seal ducts for duct static-pressure, and seal levels specified in "Duct Schedule" Article.

B. Leakage Class Definition: Leakage class of 6 means that 6 cfm of leakage per 100 sq ft of duct surface is the maximum allowable threshold if tested at 1 inch test pressure.

C. Duct Seal Levels Definitions:

1. Level A: All transverse joints, longitudinal seams, and duct wall penetrations. Pressure sensitive tape shall not be used as the primary sealant, unless it has been certified to comply with UL-181A or UL-181B and the tape is used in accordance with that certification.
2. Level B: All transverse joints, and longitudinal seams. Pressure sensitive tape shall not be used as the primary sealant, unless it has been certified to comply with UL-181A or UL-181B and the tape is used in accordance with that certification.
3. Level C: Transverse joints only.

3.3 DUCT LINER INSTALLATION

A. All ducts requiring insulation shall be lined by carefully adhering the liner in a continuous piece to clean, flat metal sheets with a quick tacking, fire-retardant adhesive.

B. Coated side of duct liner shall face the air stream.

C. All exposed edges shall be coated with adhesive.

D. Ducts over 24" width or breadth shall have liner additionally secured with spot welded pins and washers, one pin and washer to each two square feet of duct liner.

3.4 CONNECTIONS

A. Make connections to inlet and outlet of all fans and air handling units with flexible connectors.

1. Exception: Fan housings that have the entire fan and motor assembly isolated for vibration.

B. Connect supply flexible duct to main duct with high efficiency takeoff.

C. Connect diffusers or light troffer boots to ducts with maximum 10-foot lengths of flexible duct.

3.5 LIFE SAFETY DAMPER INSTALLATION

A. Install dampers in accordance with manufacturer’s UL Installation Instructions, labeling, and NFPA 90A at locations indicated on the drawings. Any damper installation that is not in accordance with the manufacturer’s UL Installation Instructions must be approved prior to installation.

B. Dampers must be accessible to allow inspection, adjustment, and replacement of components. The sheet metal contractor shall furnish any access doors in ductwork or plenums required to provide this access.

3.6 ACCESS DOOR INSTALLATION

A. Install duct access doors on sides of ducts to allow for inspecting, adjusting, and maintaining accessories and equipment at the following locations:

1. Upstream of duct coils.
2. Downstream from control dampers and backdraft dampers.
3. Adjacent to and close enough to fire or smoke dampers, to reset or reinstall fusible links.
4. Downstream from humidifiers. Include vision panel.
5. Elsewhere as indicated.

B. Label access doors according to Section 230510, Article "Equipment and Warning Labels" to indicate the purpose of access door.

3.7 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. Operate dampers to verify full range of movement.
2. Inspect locations of access doors and verify that purpose of access door can be performed.
3. Operate fire and smoke dampers to verify full range of movement and verify that proper heat-response device is installed.

3.8 DUCT SCHEDULE

A. Fabricate ducts with galvanized sheet steel except as otherwise indicated and as follows:

B. Supply Ducts:

1. Pressure Class: Minimum of 0.25-inch wg. greater than scheduled static pressure of attached supply fan.
2. Duct seal levels for pressure class up to 2-inch w.c.:
    a. Outdoor: A
    b. Unconditioned Spaces: B
    c. Conditioned Spaces: C
3. Duct seal levels for pressure class greater than 2-inch w.c.:
    a. Outdoor: A
    b. Unconditioned Spaces: A
    c. Conditioned Spaces: B

C. Return Ducts:

1. Pressure Class: Minimum of 0.25-inch wg. greater than scheduled static pressure of attached supply fan.
2. Duct seal levels for all pressure classes:
    a. Outdoor: A
    b. Unconditioned Spaces: B
    c. Conditioned Spaces: C

D. General Exhaust Ducts:

1. Pressure Class: Minimum of 0.25-inch wg. greater than scheduled static pressure of attached exhaust fan.
2. Duct seal levels for all pressure classes:
    a. Outdoor: C
    b. Unconditioned Spaces: C
    c. Conditioned Spaces: B

E. Intermediate Reinforcement:

1. Reinforcement:
    a. Angle type: 1-1/2” x 1-1/2” x 1/8” thick.
    b. Zee type: 1” (h) x 3/4” (w) x 1/8” thick
    c. Channel type: 1-1/8” (h) x 3” (w) x 1/8” thick
2. Spacing: 5 feet
    a. Up to 1” static: Ducts and plenums over 60”.
    b. Up to 3” static: Ducts and plenums over 48”.
    c. Over 3” static: Ducts and plenums over 36”.

F. Elbow Configuration:

1. Rectangular Duct, Elbow:
    a. Supply: Mitered with vanes.
    b. Return: Mitered with vanes where indicated.
2. Rectangular Duct, Radius:
    a. No Vanes: Minimum radius is equal to duct width.
    b. With Vanes: Minimum radius is equal to 1/2 of duct width.
3. Round Duct, Minimum Centerline Radius:
    a. Up to 18” diameter duct: 1/2 duct diameter.
    b. 19” diameter duct and larger: Same as duct diameter.

G. Branch Configuration: high-efficiency take-off.

1. Saddle tap allowed on existing round duct.

3.9 DUCT LINER SCHEDULE

A. 1/2” Duct Liner:

1. Where indicated on drawings.

B. 1” Duct Liner:

1. Where indicated on drawings.

END OF SECTION

SECTION 233400 – FANS AND FAN SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Cabinet fans (ceiling).

1.2 SUBMITTALS

A. Shop Drawings: For equipment covered under this section as per Section 230500.

1. Fan Product Data: Include certified performance curves and rated capacities, dampers, motor ratings, and accessories for each type of product indicated. Indicate fan's operating point on curves.

B. Operation and Maintenance Manuals: For equipment covered under this section as per Section 230500.

1.3 QUALITY ASSURANCE

A. Motors: Comply with requirements in Section 230520 "General Motor Requirements."

1.4 WARRANTY

A. Manufacturer's standard form in which manufacturer agrees to repair or replace components that fail in materials or workmanship within specified period.

1. Fan Warranty Period: Not less than one year from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Except where otherwise noted, the following general requirements shall apply:

1. Fans shall bear the AMCA Certified Ratings Seal for air performance.

2.2 MANUFACTURERS

A. Except in other Part 2 articles where noted, the following manufacturers are acceptable:

1. Acme.
2. Carnes.
3. Captive-Aire.
4. Cook.
5. JencoFan.
6. Greenheck.
7. New York Blower.
8. Peerless Blowers.
9. PennBarry.
10. S&P Ventilation Systems.
11. Twin City Fan & Blower; Twin City Fan Companies, Ltd.

B. All manufacturers are subject to compliance with requirements

C. Provide products by one of the manufacturers specified or by prior approval.

2.3 CABINET FANS (CEILING)

A. Description: Factory assembled with one or more centrifugal wheels, direct drive, enclosed in housing, with inlet grille and integral backdraft damper; AMCA rated.

B. Housing: Steel, lined with acoustical insulation, outlet collar.

C. Fan Wheel: Centrifugal wheels directly mounted on motor shaft with motor and fan mounted with resilient isolators. Fan shrouds, motor, and fan wheel shall be removable for service.

D. Grille: Plastic, non-yellowing, louvered designer grille.

E. Electrical Requirements: Junction box for electrical connection in housing and receptacle for motor plug-in.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with manufacturer's product data, including technical bulletins, product catalog installation instructions

B. Examine areas to receive fans. Notify the Engineer of conditions that would adversely affect installation or subsequent utilization and maintenance of fans. Ensure roof openings are square, accurately aligned, and correctly located

C. Install fans system as indicated on the Installation, Operation and Maintenance Manual (IOM) and contract drawings.

3.2 PROTECTION

A. Protect installed product and finished surfaces from damage during construction to ensure that, except for normal weathering, devices will be without damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 233700 – AIR OUTLETS AND INLETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Grilles, Registers, and Diffusers.

1.2 SUBMITTALS

A. Shop Drawings: For equipment covered under this section as per Section 230500.

1. Louver Product Data: Show frame profiles and blade profiles, angles, and spacing. Include color selection chart.

B. Operation and Maintenance Manuals: For equipment covered under this section as per Section 230500.

1.3 REFERENCE STANDARDS

A. ASHRAE 70 – Method of Testing the Performance of Air Outlets and Air Inlets

B. ASTM 610 – Standard Practice for Evaluating Degree of Rusting on Painted Steel Surfaces

C. ASTM 714 – Test Method for Evaluating Degree of Blistering of Paints

D. ASTM D1308 – Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes

E. ASTM D1654 – Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments

F. ASTM D4752 – Standard Practice for Measuring MEK Resistance of Ethyl Silicate (Inorganic) Zinc-Rich Primers by Solvent Rub

PART 2 - PRODUCTS

2.1 MANUFACTURERS AND GENERAL REQUIREMENTS

A. Products: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. Grilles, Registers, and Diffusers
   a. Anemostat Products: a Mestek company.
   b. Carnes.
   c. Hart & Cooley Inc.
   d. Krueger.
   e. Nailor.
   f. Price Industries.
   g. Shoemaker.
   h. Titus.
   i. Tuttle & Bailey.

B. General Diffuser Requirements:

1. Devices shall be specifically designed for variable-air-volume flows.
2. Material: Steel or aluminum.
3. Finish: Baked enamel.

C. General Registers and Grilles Requirements:

1. Material: Steel or aluminum.
2. Finish: Baked enamel.
3. Damper Type: Adjustable opposed blade per Drawing schedule.

2.2 GRILLES AND REGISTERS

A. Adjustable Louvered Grilles and Registers

1. Description: Steel or aluminum louvered grille or register suitable for supply or return.
2. Construction
    a. Steel
    b. Single deflection or double deflection per the Drawings.
    c. Supply Grilles:
        i. Face Blades: adjustable horizontal or vertical spaced as scheduled on the Drawings.
        ii. Rear Blades: adjustable horizontal or vertical spaces as scheduled on the Drawings.
    d. Return Grilles:
        i. One set of fixed deflection blades, deflection and spaces as scheduled on the Drawings.
    e. Blade orientation: as scheduled on the Drawings.
3. Frame: Grilles are to be compatible with the ceiling type as scheduled on the Drawings and the architects Reflected Ceiling Plan.
4. Paint and Finish: as scheduled on the drawings.
5. Options: As scheduled on the drawings.
    a. Opposed Blade Damper
    b. Border: where grilles are smaller than the lay-in tile, the grille shall be mounted in a steel border of the same size as the ceiling. Paint and Finish to be same as grille.
    c. Return air silencers.
    d. Removable core with stainless steel quick-release fasteners.

B. Fixed Face Grille

1. Description: Aluminum egg crate grille with cubical grid core for use as return or exhaust.
2. Construction
    a. Aluminum
    b. ½" x ½" x ½" grid, 0° core.
3. Frame: Grilles are to be compatible with the ceiling type as scheduled on the Drawings and the architects Reflected Ceiling Plan.
4. Paint and Finish: as scheduled on the drawings.
5. Options: As scheduled on the drawings.
    a. Opposed Blade Damper
    b. Border: where grilles are smaller than the lay-in tile, the grille shall be mounted in a steel border of the same size as the ceiling. Paint and Finish to be same as grille.

2.3 CEILING DIFFUSERS

A. Square Plaque Ceiling Diffuser

1. Description: Square plaque diffuser for 360° radial, horizontal air delivery.
2. Construction:
    a. Steel, consisting of a seamless, one-piece formed backpan with a round inlet collar.
    b. Inner Plaque: Removable, installed no more than ¼" below the ceiling plane

c. Face Panel: Smooth edged with rounded corners.
d. Diffusers are to be compatible with the ceiling type as scheduled on the Drawings and the architects Reflected Ceiling Plan.

3. Paint and Finish: As scheduled on the Drawings.
4. Options: As scheduled on the Drawings.
   a. Damper:
      i. Radial opposed blade damper.
      ii. Full flow damper, duct mounted.
      iii. Full flow damper, diffuser mounted.
      iv. Radial damper, diffuser mounted.

2.4 LINEAR SLOT DIFFUSER

A. Description: Linear slot diffuser with plenum attachment and blades for throw adjustment.

B. Construction:

1. Diffusers: Provide 1 to 10 discharge slots with ½", ¾", 1" or 1-1/2" slot width according to the schedule on the Drawings.
2. Supply Diffusers: Include aerodynamically curved "ice-tong" shaped pattern controllers for 180° air pattern control and airflow dampering.
3. Return Diffusers: Match supply units in appearance.
4. Diffuser Border: Extruded aluminum construction with extruded aluminum spacers with the appropriate ends to match the requirements as indicated on the Drawings.
5. Corner Modules, Splice and Alignment Plates: Provide for continuous slot assemblies.
6. Linear slot diffusers are to be compatible with the ceiling type as scheduled on the Drawings and the architects Reflected Ceiling Plan.

C. Paint and finish: as scheduled on the Drawings.

D. Plenum:

1. Sloped and Square Shoulder Diffuser Plenum:
   a. Sloped shoulder required on all supply and return diffusers in ceilings 10 feet high or lower.
   b. Square shoulder required on all supply and return in ceilings higher than 10 feet.
2. Construction: zinc coated steel, internally lined with fiber free insulation.
3. Plenum to suit both drywall and lay-in installations

E. Options: As scheduled on the Drawings.

1. Mitered Corners: where required
2. Blank off: where required
3. Alignment strips: where multiple sections are to be assembled to appear as one continuous diffuser.
4. Plaster Frame Spacers: where installed in plaster frame
5. Field Cut Diffusers: provide diffusers 6" longer than specified to allow the diffuser to be cut in the field. Field cutting shall be specified where a continuous run of diffusers is required.
6. Equalizing Core: where installed on spiral ducts.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with manufacturer's product data, including technical bulletins, product catalog installation instructions

B. Install grilles, registers, and diffusers level and plumb.

C. Install grilles, registers, and diffusers with an airtight connection to the duct system they serve, and to allow service and maintenance of any accessories, dampers, air extractors or fire dampers within.

D. Install supply, return, and exhaust air grills/diffusers a minimum 3’ away from all smoke/heat detection devices used in the fire alarm system. Field coordinate location of these devices with the pertinent contractors.

E. Ceiling-Mounted Air Outlets and Inlets: The Drawings indicate a general arrangement of ducts, fittings and accessories. The locations of GRD elements shown on the Drawings are intended to achieve airflow pattern, air volume, noise criteria, throw patterns, and pressure drop design criteria. Place diffusers where indicated on the Drawings as much as is practical. If any other disciplines items or architectural feature interfere with the position or adversely affect the throw of a diffuser, notify the Architect/Engineer for a determination on final placement.

3.2 ADJUSTMENT

A. General: Prior to Air Balancing, adjust all grille, register, and diffuser air patterns as indicated on the drawings, or as directed.

B. Linear slot diffuser

1. Adjust linear slot supply diffuser pattern controller prior to turnover to owner according to the following:
    a. Single Slot: Adjust for horizontal throw
    b. Two Slot:
        i. Near exterior wall: adjust slot nearest exterior wall for downward throw angled at the wall, and interior slot for horizontal throw.
        ii. Interior Spaces: Adjust both slots to throw horizontally away from each other.
    c. Three Slot:
        i. Near exterior wall: adjust slot nearest exterior wall and center slot to throw downward angled at the wall, and interior slot for horizontal throw.
        ii. Interior spaces: Adjust all three slots for horizontal throw.

3.3 CLEANING

A. Clean as recommended by manufacturer. Do not use material or methods which may damage finish surface or surrounding construction

3.4 PROTECTION

A. Protect installed product and finished surfaces from damage during construction to ensure that, except for normal weathering, devices will be without damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 235000 – CENTRAL HEATING EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Boilers
2. Boiler controls.
3. Gas appliance venting.

1.2 SUBMITTALS

A. Shop Drawings: For equipment covered under this section as per Section 230500.

1. Product Data: Submit capacities and accessories included with boiler. Include general layout, dimensions, size and location of water, fuel, electric, air inlet and vent connections, electrical characteristics, weight and mounting loads. Provide wiring diagrams that are specific to this project.

B. Operation and Maintenance Manuals: For equipment covered under this section as per Section 230500.

1. Include boiler start-up reports.

1.3 QUALITY ASSURANCE

A. Provide services of manufacturer's authorized and factory-trained representative to perform the following functions:

1. Inspect and verify installation.
2. Checkout and startup/supervision. Submit startup report.

B. ASME Compliance: ASME Section IV and UL 795.

1. The boiler shall bear the ASME “H” stamp and be National Board Listed for 160 psi working pressure and 250°F.

C. Gas Train and Safety Controls: Conform to requirements of UL 795 and CSD-1.

1.4 WARRANTY

A. Manufacturer's standard form in which manufacturer agrees to repair or replace components that fail in materials or workmanship within specified period.

1. Warranty Period: Not less than one year from the date of Substantial Completion.

B. Cast Iron Condensing Boilers:

1. Cast Iron Block Heat Exchanger: 25-year limited: cover defects in materials, workmanship, condensate corrosion and failure due to thermal shock; repair or replace defective heat exchanger.
2. Secondary Heat Exchanger: 5-year limited: cover defects in materials, workmanship, condensate corrosion and failure due to thermal shock; repair or replace defective heat exchanger.

PART 2 - PRODUCTS

2.1 GAS BOILERS

A. Description: Packaged, modulating, power-vented, condensing efficiency gas fired boiler with integral controls. Intended for installation in a primary/secondary hydronic system.

B. Manufacturers: Subject to compliance with requirements and the below specified materials and construction, provide products by one of the following or other prior approved:

1. Advanced Thermal Hydronics (KN)
2. Laars
3. Lochinvar
4. PK
5. RBI
6. Thermal Solutions

C. Boiler Fit and Installation Requirements:

1. Whether allowed in part B above or Prior Approved, it is the sole responsibility of the installing Contractor to ensure that any substituted equipment is equivalent in fit, form and function to the scheduled and specified equipment. This includes verifying the boiler pump pressure loss and flow and providing different pumps and all electrical wiring and electrical accessories to ensure a fully operable system. The cost of any additional work caused by the substitution of equipment shall be borne by the Contractor.

D. Boiler shall be Condensing.

E. Allowed heat exchanger materials: Copper-fin tube, stainless steel, cast iron.

F. Headers and Heat Exchangers shall not contain gaskets, bolts, push nipples or o-rings.

G. Combustion Chamber:

1. Viewport for visual inspection of burner.

H. Burner: Natural gas,

1. Turndown: Minimum 5:1, maximum 10:1.
2. Minimum Thermal Efficiency: 86% Per ANSI/AHRI 1500

I. Blower: Centrifugal fan to operate during each burner firing sequence and to pre-purge and post-purge the combustion chamber.

1. Include a replaceable or washable air filter.
   a. Include 1 additional filter per boiler for turnover to owner at project completion.

J. Venting and Combustion:

1. Flue material: UL Listed to UL1738. Materials must also be compliant with National, State and Local codes.
   a. PVC and CPVC are not allowed for venting.
2. Air intake material: See boiler manufacturer recommendations, and adhere to national, state, and local codes.

K. Gas Train: Combination gas valve with manual shutoff and pressure regulator.

L. Casing:

1. Jacket: Minimum 16 gauge steel with factory coating. Access sections with or without hinges are required for easy access to all operating controls and maintenance items.
2. Control Compartment Enclosures: Boiler shall be capable of operation with any jacket panels removed.
3. Combustion-Air Connections: Inlet and vent duct collars.

M. Electrical:

1. See the schedule on the Drawings for electrical input to the boiler. The boiler shall include factory mounted and wired transformer and fuses to allow for a single point power connection.

N. Controls:

1. Coordinate the controls contractor for controls required to adhere to Specification 230990.
2. Boiler is to be capable of stand-alone and linked operation.

O. Boiler Trim:

1. Safety Relief Valve: ASME rated set at 50 psig.
2. Pressure and Temperature Gage: Operating-pressure and -temperature ranges so normal operating range is about 50 percent of full range.
3. Testable low water cutoff.
4. Flow sensor.
5. Adjustable high limit temperature controller with manual reset.
6. Adjustable operating temperature controller.
7. Drain Valve: Minimum 3/4" hose-end gate valve.
8. Manufacturer condensate neutralization kit with condensate piping from boiler to nearest building drain. One per boiler unless otherwise indicated on the Drawings.
9. Provide barometric dampers for multiple boilers where they share a common vent if required.

2.2 BOILER CONTROLS – GAS

A. Controller:

1. Display: Capable of boiler setup, boiler monitoring, and boiler diagnostics, accessible from front.
2. Power Supply: 120/1/60; Include control transformer. Control transformer shall be minimum 50 VA, or as coordinated with the Division 230900 contractor for their requirements to be met + 10% capacity.

B. Features: Multiple loop temperature setpoints with individual outdoor air reset curves; pump delay; domestic hot water prioritization; Cascade logic for lead-lag or modulation of up to eight boilers.

1. Archive History: Record all hard lockouts, soft lockouts, sensor faults, sequencer faults. Store minimum of 100 events.
2. Pump Control Capability: Variable speed boiler pump for constant Delta T at all modulation rates; variable speed system pump; domestic hot water pump.

C. Sequence of Operation: Electric, factory-fabricated and field-installed panel to control burner firing rate and boiler circulator pump in response to building automation signal.

D. Burner Safety Controls:

1. High Cutoff: Manual reset stops burner if operating conditions rise above maximum boiler design temperature.
2. Testable Low-Water Cutoff Switch: Electronic probe shall prevent burner operation on low water. Cutoff switch shall be automatic-reset type.
3. Blocked Inlet Safety Switch: Manual-reset pressure switch field mounted on boiler combustion-air inlet.
4. Audible Alarm: Factory mounted on control panel with silence switch; shall sound alarm for above conditions.

E. Building Automation System Interface: Factory install hardware and software to enable building automation system to monitor, control, and display boiler status and alarms.

1. BMS Inputs: 0-10 VDC signal for setpoint; enable-disable; variable system pump signal.

2. BMS Outputs: 0-10 VDC of boiler modulation.
3. Low-voltage Terminal Strip Contacts: Alarm, low water cutoff, flow switch, water tank thermostat, system supply sensor, outdoor air sensor, BMS signal.
4. High-voltage Terminal Strip Contacts: Integral relays; system pump, boiler pump, domestic hot water pump.

PART 3 - EXECUTION

3.1 INSTALLATION OF LISTED VENTS AND CHIMNEYS

A. Locate to comply with minimum clearances from combustibles and minimum termination heights according to product listing or NFPA 211, whichever is most stringent.

B. Seal between sections of positive-pressure vents according to manufacturer's written installation instructions, using sealants recommended by manufacturer.

C. Support vents at intervals recommended by manufacturer to support weight of vents and all accessories, without exceeding appliance loading.

D. Slope breechings down in direction of appliance, with condensate drain connection at lowest point piped to nearest drain.

E. Lap joints in direction of flow.

F. After completing system installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finishes.

G. Clean breechings internally, during and after installation, to remove dust and debris. Clean external surfaces to remove welding slag and mill film. Grind welds smooth and apply touchup finish to match factory or shop finish.

H. Provide temporary closures at ends of breechings, chimneys, and stacks that are not completed or connected to equipment.

3.2 VENTING APPLICATION

A. See Boiler Specifications in Part 2 of this Article for venting materials and requirements.

3.3 BOILER INSTALLATION

A. Comply with manufacturer's product data, including technical bulletins, product catalog installation instructions

B. Install this system as indicated on the Installation, Operation and Maintenance Manual (IOM), and contract drawings and install boilers in accordance with manufacturer's instructions.

C. Equipment Mounting: Install boilers on cast-in-place concrete equipment base(s). Comply with requirements for equipment bases specified in Division 3.

1. Coordinate sizes and locations of concrete bases with actual equipment provided.
2. Construct concrete bases 4 inches high and extend base not less than 6 inches in all directions beyond the maximum dimensions of boiler unless otherwise indicated.

D. Install skid plumb and level, to plus or minus 1/16 inch over base.

E. Maintain manufacturer's recommended clearances around and over equipment, and as required by local Code.

F. Arrange all electrical conduit, piping, exhaust vent, and air intake with clearances for burner removal and service of all equipment.

G. Connect exhaust vent to boiler vent connection, full size of outlet.

H. Connect full sized air inlet vent to connector on boiler.

I. Connect fuel piping in accordance with NFPA 54.

J. Install discharge piping from relief valves and drain valves to nearest floor drain.

K. Install a condensate trap and the manufacturers condensate neutralization kit and pipe to the nearest drain.

3.4 BOILER START-UP

A. Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections. Report results in writing.

3.5 DEMONSTRATION

A. Demonstrate operation and maintenance procedures to owner.

END OF SECTION

SECTION 235700 – HEAT EXCHANGERS FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes following types of air heat and energy exchangers:

1. Air-to-air energy exchanger.

B. Section includes following types of hydronic heat exchangers:

1.2 SUBMITTALS

A. Shop Drawings: For equipment covered under this section as per Section 230500.

1. Air-to-air energy recovery equipment Shop Drawings
   a. Detail equipment assemblies and indicate dimensions, weights, loads, and required clearances.
   b. Wiring Diagrams: For power, signal, and control wiring.
2. Water-to-water heat exchangers:
   a. Include rated capacities, operating characteristics, and furnished specialties and accessories.

B. Operation and Maintenance Manuals: For equipment covered under this section as per Section 230500.

1.3 QUALITY ASSURANCE

A. Motors: Comply with requirements in Section 230520 "General Motor Requirements."

1.4 WARRANTY

A. Manufacturer's standard form in which manufacturer agrees to repair or replace components that fail in materials or workmanship within specified period.

1. Warranty Period: Not less than one year from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 AIR-TO-AIR ENERGY EXCHANGER, FLAT PLATE

A. Description: Packaged static plate energy recovery ventilator.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. ConsERV; Dais Analytic Corp.
2. Nu-Air Ventilation Systems, Inc.
3. RenewAire LLC.
4. Venmar.

C. Casing: Galvanized steel with duct collars.

1. Access doors for servicing blowers, energy transfer elements, and filters.
2. Single wall construction indoors, double wall construction outdoors.

D. Casing Insulation: 1-inch-thick, foil-faced glass fiber or FSK high-density board insulation.

E. Plates: Evenly spaced and sealed and arranged for counter airflow.

1. Type: Enthalpy transfer.
2. Frost Control: Passive.

F. Blowers: Forward curved centrifugal, direct or belt drive.

1. Direct Drive: Multi-speed motor.
2. Belt Drive: Adjustable pulleys and mounts.
3. Motors: Standard NEMA frames, thermal overload protection, integral starter.

G. Filters: 2" pleated, disposable.

H. Electrical Connections: Single point power and single 24 VAC control.

I. Options:

1. Provide 3 spare sets of filters.
2. Factory mounted filter alarms – both airstreams.

PART 3 - EXECUTION

3.1 AIR-TO-AIR EXCHANGER INSTALLATION

A. Equipment Mounting:

1. On factory roof curb with wind clips.

B. Install units with clearances for service and maintenance.

C. Install new filters at completion of equipment installation and before testing, adjusting, and balancing.

D. Provide flexible duct connections at unit duct flanges.

E. Pipe drains from drain pans to nearest floor drain; use ASTM D 1785, Schedule 40 PVC pipe and solvent-welded fittings, same size as condensate drain connection.

3.2 AIR-TO-AIR EXCHANGER START-UP

A. Start-up and verification testing shall be performed by the Contractor.

B. Operational Test: After electrical circuitry has been energized, start units to confirm proper unit operation. Remove malfunctioning units, replace with new units, and retest.

C. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

END OF SECTION

SECTION 236000 – CENTRAL COOLING EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Cooling tower (Alternate Bid)

1.2 SUBMITTALS

A. Shop Drawings: For equipment covered under this section as per Section 230500.

1. Cooling Tower Product Data: For each type of product indicated. Include rated capacities, pressure drop, performance data, furnished specialties, and accessories.
   a. Include complete set of manufacturer's prints of cooling tower assemblies, control panels, sections and elevations, and unit isolation.
2. Wiring Diagrams: For power, signal, and control wiring.

B. Operation and Maintenance Manuals: For equipment covered under this section as per Section 230500.

1. Include cooling tower startup service reports.

1.3 QUALITY ASSURANCE

A. Cooling Tower Start-Up Report: Provide services of manufacturer's authorized and factory-trained representative to perform start-up services and submit a written report. The following will be addressed as minimum:

1. Verification of installation.
2. Verification of passivation plan implemented.
3. Verification of chemical treatment plan implemented.
4. Verification of all safety interlocks.
5. Verification of mechanical float valve.
6. Verification of fan rotation direction.
7. Verification of fan lubrication.
8. Verification of vibration switch operation.
9. Harmonic imbalance on variable speed fans.
10. Power supply voltage, amperages, and correct power phasing.
11. Bleed valve flow rate.
12. Submit startup report.

B. ASHRAE/IESNA 90.1 Cooling Tower Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6 - "Heating, Ventilating, and Air-Conditioning."

C. ASME Cooling Tower Compliance: Fabricate and label heat-exchanger coils to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

D. Motors: Comply with requirements in Section 230520 "General Motor Requirements."

1.4 COOLING TOWER SOURCE QUALITY CONTROL

A. Verification of Performance: Test and certify cooling tower performance according to CTI STD 201, "Certification Standard for Commercial Water-Cooling Towers Thermal Performance."

1.5 WARRANTY

A. Manufacturer's standard form in which manufacturer agrees to repair or replace components that fail in materials or workmanship within specified period.

1. Warranty Period: Not less than one year from the date of Substantial Completion.

B. Cooling Tower:

1. Fan assembly including fan, drive, and motor: Not less than five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 COOLING TOWER

A. General

1. Furnish and install one factory-assembled, forced-draft, crossflow cooling tower. The tower shall have air entry on one side only. The tower shall have the fan and all moving parts located in the dry entering airstream to provide greater reliability and long life. The cooling tower shall be Baltimore Aircoil Company as scheduled on drawing. Equipment tower by Evapco, Inc. is acceptable.

B. Thermal Capacity

1. The cooling tower shall be warranted by the manufacturer to provide cooling capacity as scheduled on drawings. Additionally, the performance shall be certified by the Cooling Technology Institute in accordance with CTI Certification Standard STD-201. Lacking such certification, a field acceptance test shall be conducted within the warranty period in accordance with CTI Acceptance Test Code ATC-105, by the Cooling Technology Institute or other CTI-accredited independent testing agency. The cooling tower shall comply with the energy efficiency requirements of ASHRAE Standard 90.1.

C. Corrosion Resistant Construction

1. Unless otherwise noted in this specification, all steel panels and structural members shall be protected with the Thermosetting Hybrid Polymer. The system shall consist of G-235 (Z700 metric) hot-dip galvanized steel prepared in a four-step (clean, pre-treat, rinse, dry) process with an electrostatically sprayed, thermosetting, hybrid polymer fuse-bonded to the substrate during a thermally activated curing stage and monitored by a 23-step quality assurance program. Coatings other than the Thermosetting Hybrid Polymer must be submitted to the engineer for pre-approval. Approved equals must have undergone testing, resulting in the following results as a minimum:
    a. When X-scribed to the steel substrate it shall be able to withstand 6000 hours of 5% salt spray per ASTM B117 without blistering, chipping, or loss of adhesion;
    b. When X-scribed to the steel substrate it shall be able to withstand 6000 hours of exposure to acidic (pH=4.0) and alkaline (pH=11.0) water solutions at 95ºF (35ºC) without signs of chemical attack;
    c. Shall withstand impact of 160 in-lbs per ASTM D2794 without fracture or delamination of the polymer layer;
    d. Shall withstand 6000 hours of ultraviolet radiation equivalent to 120,000 hours of noontime sun exposure without loss of functional properties;
    e. Shall withstand 200 thermal shock cycles between - 25ºF (-32ºC) and +180ºF (82ºC) without loss of adhesion or other deterioration;
    f. Shall withstand 6000 hours of exposure to 60 psi (42,184.5 kg/m2) water jet without signs of wear or erosion.

D. Quality Assurance

1. The cooling tower manufacturer shall have a Management System certified by an accredited registrar as complying with the requirements of ISO-9001:2000 to ensure consistent quality of products and services.

2.2 Construction Details

A. Stainless-Steel Cold-Water Basin

1. All steel components in the cold water basin below the overflow level and in contact with the basin water shall be made of type 304 stainless steel. All other steel panels and structural elements shall be made from heavy-gauge G-235 (Z700 metric) hot-dip galvanized steel, with cut edges given a protective coating of zinc-rich compound.

B. Water Distribution

1. Hot water distribution basin shall be open gravity type and constructed of heavy gauge, G-235 (Z700 metric) hot-dip galvanized steel. Basin weirs and plastic metering orifices shall be provided to assure even distribution of water over the fill surface. Lift-off distribution covers shall be constructed of heavy gauge, G-235 (Z700 metric) hot-dip galvanized steel.

2.3 Mechanical Equipment

A. Fan

1. Fan shall be heavy-duty, axial flow type. Air shall be forced into the tower through a fan cylinder designed for streamlined air entry and minimum fan blade tip clearance for maximum fan efficiency.

B. Bearings

1. Fan(s) shall be mounted directly on the motor shaft or mounted on a horizontal solid steel shaft supported by two heavy-duty, self-aligning, relubricatable ball bearings with cast iron housings and designed for minimum L10 life of 40,000 hours (280,000 Hr. Avg. Life). Extended lubrication lines are provided for ease of maintenance.

C. Fan Drive

1. Fan shall be direct driven or driven by V-belts designed for not less than 150% of motor nameplate horsepower. Drives and all moving parts shall be protected by removable steel screens that shall ship installed on the unit.

D. Fan Motor

1. Fan motor shall be totally enclosed fan cooled (TEFC), reversible, squirrel cage, ball bearing type, designed specifically for cooling tower service. The motor shall be furnished with special moisture protection on winding, shafts and bearings and labeled specifically for “Cooling Tower Duty.” Fan motors shall be inverter duty type designed per NEMA Standard MG1, Section IV, Part 31.

E. Mechanical Equipment Warranty

1. The fan, fan shaft, bearings, mechanical equipment support and fan motor shall be warranted against defects in materials and workmanship for a period of five (5) years from date of shipment. An additional two years of warranty, for a total of seven (7) years, shall be provided for fan motor when space heaters are field-wired at time of initial installation.

2.4 Fill And Drift Eliminators

A. Fill and Drift Eliminators

1. The fill and integral drift eliminators shall be formed from self-extinguishing polyvinyl chloride (PVC) having a flame spread rating of 5 per ASTM E84 and shall be impervious to rot, decay, and fungus or biological attack. The fill shall be suitable for entering water temperatures up to and including 125°F (51.7°C). The fill shall be manufactured and performance tested by the cooling tower manufacturer to provide single source responsibility and assure control of the final product.

2.5 ACCESSORIES

A. Basin Water Level Control

1. Level control is existing to remain on existing indoor tank.

B. Vibration Cutout Switch

1. Provide a mechanical local reset vibration switch. The mechanical vibration cutout switch shall be guaranteed to trip at a point so as not to cause damage to the cooling tower. To ensure this, the trip point will be set in a frequency range of 0 to 3,600 RPM and a trip point of 0.2 to 2.0 g's.

C. Variable Frequency Drives

1. Existing to remain for continued use.

D. Safety Switch

1. Fused disconnect switch by Electrical Contractor.

PART 3 - EXECUTION

3.1 COOLING TOWER INSTALLATION

A. Install cooling towers on support structure or on concrete base as indicated. Comply with requirements in Division 03 for concrete pads.

B. Install roof-mounting units on equipment supports specified in Division 07.

C. Maintain manufacturer's recommended clearances for service and maintenance.

D. Install separate devices furnished by manufacturer and not factory installed.

E. Set and balance water flow to tower inlet.

F. Adjust water-level control for proper operating level.

3.2 COOLING TOWER CONNECTIONS

A. Install piping adjacent to cooler to allow service and maintenance.

3.3 COOLING TOWER STARTUP SERVICE

A. Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections. Report results in writing.

B. Operational Test: After electrical circuitry has been energized, start units to confirm proper unit operation. Remove malfunctioning units, replace with new units, and retest.

C. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Complete installation and startup checks according to manufacturer's written instructions and perform the following:

1. Clean entire unit including basins.
2. Lubricate bearings.
3. Verify fan rotation for correct direction and for vibration or binding and correct problems.
4. Adjust belts to proper alignment and tension.
5. Operate variable-speed fans through entire operating range and check for harmonic vibration imbalance. Set motor controller to skip speeds resulting in abnormal vibration.
6. Check vibration switch setting. Verify operation.
7. Verify water level in tower basin. Fill to proper startup level. Check makeup water-level control and valve.
8. Verify that cooling tower air discharge is not recirculating air into tower or HVAC air intakes. Recommend corrective action.
9. Replace defective and malfunctioning units.

E. Start cooling tower and associated water pump. Follow manufacturer's written starting procedures.

END OF SECTION

SECTION 238000 – DECENTRALIZED HVAC EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Water-to-air heat pumps.
2. Air coils, electric.
3. Air Purifier

1.2 SUBMITTALS

A. Shop Drawings: For equipment covered under this section as per Section 230500.

1. Water-to-air heat pumps:
   a. Design Characteristics: Make and model, performance, components, controls, furnished options.
   b. Physical Characteristics: Quantities, materials, drawings with dimensions and field connections, weights, clearances.
   c. Electrical Characteristics: Power requirements, wiring diagrams for power and controls, furnished safeties.
2. Air coils, electric:
   a. Design Characteristics: Make and model, performance, components, controls, furnished options.
   b. Physical Characteristics: Quantities, materials, drawings with dimensions and field connections, clearances.
   c. Electrical Characteristics: Power requirements, wiring connections for power and controls, furnished safeties.
   d. .
3. Air Purifiers
   a. Design Characteristics:
   b. Physical Characteristics: Quantities, materials, drawings with dimensions and field connections, weights, clearances.
   c. Electrical Characteristics: Power requirements, wiring diagrams for power and controls.

B. Operation and Maintenance Manuals: For equipment covered under this section as per Section 230500.

1. Include: Heat Pump start-up report.

1.3 QUALITY ASSURANCE

A. ASHRAE/IESNA 90.1 Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6 - "Heating, Ventilating, and Air-Conditioning."

B. Motors: Comply with requirements in Section 230520 "Common Motor Requirements."

C. Refrigeration System Safety: Comply with ASHRAE 15.

D. Methods of Testing Cooling And Heating Coils: Comply with ASHRAE 33.

E. Heat Pumps: Provide start-up services of manufacturer's authorized and factory-trained representative.

1.4 REFERENCE CODES AND STANDARDS

A. The following codes and standards are referenced throughout. The edition to be used is that currently enforced by the authority having jurisdiction (AHJ) or in absence of such direction that referenced by the current enforceable IBC code or as indicated by the contract documents, except where specifically referenced by this section of the specifications.

1. ASHRAE Standards 62 & 52
2. National Electric Code NFPA 70
3. UL 867 including ozone chamber test required as of December 21, 2007
4. UL 2998 Environment – No Ozone Certification
5. The cold plasma equipment and power supply shall be UL listed.
6. ASHRAE 62 now requires all electronic air cleaners to be UL 2998 certified as an ozone free device. Products without UL 2998 shall not be acceptable.

1.5 WARRANTY

A. Manufacturer's standard form in which manufacturer agrees to repair or replace components that fail in materials or workmanship within specified period.

1. Warranty Period: Not less than one year from the date of Substantial Completion.

B. Water-Source Heat Pumps: Not less than five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 WATER-TO-AIR HEAT PUMPS

A. Description: Packaged water-to-air, extended range heat pump with temperature controls; factory assembled, tested, and rated according to ETL and ARI-ISO-13256-1; meeting ASHRAE 90.1-2010 efficiency standard.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or other prior approved:

1. ClimateMaster, Inc.
2. Daiken Applied
3. Trane.

C. Cabinet and Chassis: Galvanized-steel casing with the following features:

1. Access panel for access and maintenance of internal components.
2. Knockouts for electrical and piping connections.
3. Flanged duct connections.
4. Cabinet Insulation: Glass-fiber liner, minimum 1/2 inch thick.
5. Condensate Drainage: Plastic or stainless-steel drain pan with condensate drain piping projecting through unit cabinet.
6. Service and Caution Labels: Placed on unit in appropriate locations.

D. Sound Attenuation Package:

1. Minimum 1/2-inch-thick compressor enclosure and front panel. Foam gasket around the compressor and perimeter of end panel.
2. Sound attenuating blanket over compressor.

E. Fan: Direct driven, centrifugal, with multispeed motor resiliently mounted in fan inlet.

1. Motor: Multispeed, permanently lubricated, permanent split capacitor motor.

F. Refrigerant-to-Water Heat Exchangers: Coaxial heat exchangers with copper water tube with enhanced heat-transfer surfaces inside a steel shell; both shell and tube leak tested to 450 psig on re

frigerant side and 400 psig on water side. Factory mount heat exchanger in unit on resilient rubber vibration isolators.

G. Refrigerant-to-Air Coils: Copper tubes with aluminum fins, leak tested to 450 psig.

H. Refrigerant Circuit Components:

1. Sealed Refrigerant Circuit: Charge with R-410A refrigerant.
2. Charging Connections: Service fittings on suction and liquid for charging and testing.
3. Reversing Valve: Pilot-operated sliding-type valve designed to be fail-safe in heating position with replaceable magnetic coil.
4. Compressor: Hermetic rotary, reciprocating, or scroll compressor installed on vibration isolators and housed in an acoustically treated enclosure with factory-installed safeties as follows:
    a. Anti-recycle timer.
    b. High-pressure cutout.
    c. Low-pressure cutout or loss of charge switch.
    d. Internal thermal-overload protection.
    e. Condensate overflow switch to stop compressor with high condensate level in condensate drain pan.
5. Refrigerant Piping Materials: ASTM B 743 copper tube with wrought-copper fittings and brazed joints.
6. Pipe Insulation: Refrigerant minimum 3/8-inch-thick, flexible elastomeric insulation on piping exposed to airflow through the unit. Maximum 25/50 flame-spread/smoke-development indexes according to ASTM E 84.
7. Refrigerant Metering Device: Thermal expansion valve to allow specified operation with entering fluid temperature testing.

I. Filters: Disposable, glass-fiber or pleated type, 1 inch thick, factory installed.

J. Controls:

1. Basic Unit Controls:
    a. Low- and high-voltage protection.
    b. Overcurrent protection for compressor and fan motor.
    c. Random time delay, three to ten seconds, start on power up.
    d. Time delay override for servicing.
    e. Thermostat field interface terminal strip
    f. Control voltage transformer. Minimum 50 VA, or as coordinated with the Division 230900 contractor for their requirements to be met + 10% capacity.
2. Safety Controls:
    a. Anti-short cycle compressor protection.
    b. Circuit breaker.
    c. Low- and high-pressure switch.
    d. Condensate overflow.
    e. Freeze protection.

K. Electrical Connection: Single electrical connection.

2.2 HOSE KITS

A. General: Hose kits shall be designed for minimum 400 psig working pressure, and operating temperatures from 32 to 210 °F. Tag hose kits to equipment designations.

B. Hose: Minimum diameter, equal to water-source heat-pump connection size.

C. Strainer: Y-type with blowdown valve in supply connection.

D. Balancing Device: Mount in return connection. Include meter ports to allow flow measurement with differential pressure gage.

1. Automatic balancing valve, factory set to operate within 10 percent of design flow rate over a 40:1 differential pressure range of 2 to 80 psig. Assembly includes isolation valves.

2.3 AIR COILS, ELECTRIC

A. Manufacturers: Subject to compliance with requirements, provide coils that are not integral part of air handling units by one of the following or other prior approved:

1. Brasch Manufacturing Co., Inc.
2. INDEECO.
3. Neptronic.
4. Thermolec.

B. Coil Assembly: Comply with UL 1995.

C. Physical Characteristics:

1. Heating Elements: Open-coil resistance wire of 80 percent nickel and 20 percent chromium, supported and insulated by floating ceramic bushings recessed into casing openings, and fastened to supporting brackets.
2. Frames: Galvanized-steel channel frame, for slip-in or flanged mounting.

D. High-Temperature Coil Protection: Disk-type, automatically reset, thermal-cutout, safety device; serviceable through terminal box without removing heater from duct or casing.

1. Secondary Protection: Load-carrying, manually reset or manually replaceable, thermal cutouts; factory wired in series with each heater stage.

E. Control Panel: Unit mounted with disconnecting means and overcurrent protection. Include the following controls:

1. Magnetic contactor.
2. Toggle switches; one per step.
3. Step controller.
4. Time-delay relay.
5. Pilot lights; one per step.
6. Airflow proving switch.

F. Refer to Section 230900 "HVAC Controls" for thermostat.

2.4 AIR PURIFIER

A. Description: Auto-cleaning, REME-LED system designed for up to 6,500 CFM. Designed for installation in interior duct wall.

B. Manufacturer: These devices are called for by Owner so no substitutions will be accepted:

1. HALO-LED, REME LED

C. Features:

1. Mercury and ozone free
2. Seven year limited warranty
3. Long-life replaceable LED cell module with 2.5x longer life that current mercury vapor UV lamp technologies.

D. Construction.

1. Power supply enclosure with mounting plate and adhesive foam gasket and aluminum seal.

2. Automatic self-cleaning Bi-polar ionizer.
3. HALO-LED Cell
4. Hybrid ceramic catalyst
5. Quard-metallic PHI catalyst

E. Dimensions:

1. 11” probe/6.5”x7.5” plate / 6 lbs
2. Mechanical airflow switches are an unacceptable means to control airflow and unit modulation.

F. Electrical

1. Air purifier shall be interlocked with equipment fan.
2. 24 volt VAC/DC input (24 VAC transformer included)
   a. This contractor shall coordinate electrical requirements with air purification manufacturer during submittals.
3. Amps: .7A operating
4. Power: 17 watts operating
5. Frequency: 60 Hz

PART 3 - EXECUTION

3.1 WATER-SOURCE HEAT PUMP INSTALLATION

A. Install heat pumps on support structure or on concrete base as indicated. Comply with requirements in Division 03 for concrete pads.

1. Equipment Mounting: Install heat pump using elastomeric mounts with minimum 1/4” deflection.

B. Suspended Units: Suspend and brace units from structural-steel support frame using threaded steel rods and elastomeric or spring hangers.

C. Maintain manufacturer's recommended clearances for service and maintenance.

D. Install piping adjacent to heat pump to allow service and maintenance.

E. Connect piping to heat pumps with hose kits.

F. Connect supply and return ducts to heat pumps with flexible duct connectors.

3.2 AIR PURIFIER SYSTEMS

A. Install units level and plumb, maintaining manufacturer's recommended clearances and tolerances.

B. Install units per manufacturers instruction and in strict accordance with local and state codes.

C. Mounting hardware shall be provided by the manufacturer.

D. All equipment shall be assembled and installed in a workman like manner to the satisfaction of the owner, architect, and engineer.

E. Any material damaged by handling, water or moisture shall be replaced, by the mechanical contractor, at no cost to the owner.

F. Protect equipment from dust and damage on a daily basis throughout construction.

G. Electrical: Wiring, conduit and junction boxes shall be installed within housing plenums in accordance with NEC NFPA 70. This contractor shall coordinate electrical requirements with air purification manufacturer during submittals.

H. Testing: Provide the manufacturers recommended electrical tests.

3.3 HYDRONIC FIELD QUALITY CONTROL

A. Perform the following electric coil field tests and inspections:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Operational Test: After electrical circuitry has been energized, operate electric coils to confirm proper unit operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

END OF SECTION

SECTION 260500 – COMMON WORK RESULTS FOR ELECTRICAL

PART 1 – GENERAL

1.1 DESCRIPTION

A. Specification Format

1. These Specifications are written in imperative and abbreviated form. This imperative language of the technical sections is directed at the Contractors, unless specifically noted otherwise. Incomplete sentences shall be completed by inserting "shall", "the Contractor shall", and "shall be", and similar mandatory phrases by inference in the same manner as they are applied to notes on the Drawings. The words "shall be" shall be supplied by inference where a colon (:) is used within sentences or phrases. Except as worded to the contrary, perform all indicated requirements whether stated imperatively or otherwise.
2. Three Part Format
   a. "Part 1.0 - General": Covers those areas which relate to the Work, and which define the general administrative and technical requirements specific to a particular section.
   b. "Part 2.0 - Products": Defines, in detail, the acceptance equipment and materials to be incorporated into the Work.
   c. "Part 3.0 - Execution": Describes, in detail, the manner in which items covered by Part 2 are to be incorporated into the Work.
3. Where Codes, Specifications and Drawings are in conflict, the Contractor will be deemed to have bid the more expensive method. Refer all such discrepancies immediately to the Engineer prior to commencing related work.

B. Definitions

1. "Furnish" - Supply equipment as required by these Drawings and Specifications, delivered to the job site for installation or use by others.
2. "Install" - Fix in position for total operational use all apparatus as shown, specified or required. Provide all miscellaneous fittings and wiring supplies.
3. "Or Approved Equal" - Equipment or materials selected by Contractor subject to Engineer's acceptance.
4. "Or Equivalent" - Equipment or materials selected by Contractor matching the function and performance of equipment or materials listed.
5. "Provide" - Furnish and install in place, total and operational.
6. “Manufacturer’s Representative” – person properly trained/certified for the specific equipment and a regular employee of the Manufacturer, the Manufacturer’s Representative Agency, a third party specializing company, or the selling distributor.
7. "Substantial Completion" - The date when the project has been completed, inspected, and accepted by the Engineer and Owner.

C. Work Included

1. Provide labor, equipment and materials in connection with Work specified and shown on Drawings.
2. Work of this Division is subject to requirements of Instructions to Bidders, General Conditions, Supplementary Conditions, Division One, and all other sections of this Specification.
3. Examine site and all Contract documents prior to submittal of bid.

D. Work Installed But Furnished Under Other Directives

1. Provide service for electrically operated equipment not specified in Division 26, 27 & 28. Verify size and locations of such connections by securing all rough-in requirements from the equipment supplier.
2. Equipment requiring electrical service shall be furnished with motors, special controls and remote electrical devices as specified in other Divisions.
3. Verify extent of controls and devices furnished by referring to Divisions where Work is specified.
4. Provide disconnects, starters, control devices, thermal units, fuses, switches and all necessary power and control wiring. Include the installation of remote electrical devices furnished separately with the equipment. Provide identification for remote devices as directed by the Engineer.
5. Contractors of other Divisions providing electrically operated equipment shall verify with the Electrical Contractor the proper voltage and phase before releasing equipment for shipment.
6. Unless otherwise specified, Contractor responsible for furnishing such equipment is also responsible for setting in place.

1.2 ALTERNATES

A. General

1. The work of this Section is affected by the Alternates described in this Specification.

B. Alternate #1 No Electrical Work.

C. Alternate #2 No Electrical Work.

D. Alternate #3

1. The Owner wishes to know in advance the possible cost to replace the existing entrance canopy lighting on 2nd floor with new as shown on the project drawings.
2. Base Bid: Existing entrance lighting remains as is with revised controls as per the project drawings.
3. Under Alternate Bid #3 on the Bid Form, state the Contract Sum to replace the existing entrance canopy lighting on 2nd floor with new as shown on the project drawings.

E. Alternate #4

1. The Owner wishes to know in advance the possible cost to add motorized shades at the new lobby windows on 3rd floor as shown on the project drawings.
2. Base Bid: No new windows and shades at the 3rd floor lobby space.
3. Under Alternate Bid #4 on the Bid Form, state the Contract Sum to add motorized shades at the new lobby windows on 3rd floor as shown on the project drawings.

F. Alternate #5 No Electrical Work.

G. Alternate #6

1. The Owner wishes to know in advance the possible cost to add electric air purification to the remaining heat pumps as shown on the project drawings.
2. Base Bid: No additional air purification units except those shown on first floor.
3. Under Alternate Bid #6 on the Bid Form, state the Contract Sum to add electric air purification to the remaining heat pumps as shown on the project drawings.

H. Alternate #7 No Electrical Work.

I. Alternate #8

1. The Owner wishes to know in advance the possible cost to replace the existing cooling tower with new. Electrical work will mainly consist of disconnecting the existing cooling tower and reconnecting the new one to the location shown on the project drawings.
2. Base Bid: Relocate the existing cooling tower as shown on the project drawings.
3. Under Alternate Bid #8 on the Bid Form, state the Contract Sum to replace the existing cooling tower with new. Electrical work will mainly consist of disconnecting the existing cooling tower and reconnecting the new one to the location shown on the project drawings.

J. Alternate #9 No Electrical Work.

K. Alternate #10

1. The Owner wishes to know in advance the possible cost to replace the existing parking lot lighting with new LED fixtures as listed on the fixture schedule and shown on the project drawings.
2. Base Bid: Existing parking lot fixtures remain as is.
3. Under Alternate Bid #10 on the Bid Form, state the Contract Sum to replace the existing parking lot lighting with new LED fixtures as listed on the fixture schedule and shown on the project drawings.

L. Alternate #11 No Electrical Work.

M. Alternate #12 No Electrical Work.

1.3 NOT USED

1.4 SUBMITTALS

A. Substitution and Prior Approval to Quote.

1. The reference to manufacturer's name and catalog or model numbers shall be interpreted as establishing a standard of quality, not as limiting competition.
2. Suppliers wishing to price material or equipment not referenced in Specifications or on Drawings shall apply in writing to Engineer for approval to quote. Electronic submittals shall be in PDF format. Include complete descriptive technical data on the proposed item consisting of: model numbers, type, size and performance characteristics. Procedure also applies to requests by Contractor. Self-addressed, stamped envelope required for return reply.
3. The request for prior approval to quote shall be received in Engineer's office no later than 192 hours (eight days) prior to bid opening. All substitute items approved for quotation will be listed in Addenda sent to all planholders in advance of bid opening.
4. Contractors choosing to use material or equipment other than those shown on Drawings or specified in detail, but approved for quotation, shall be responsible for physical dimensions and coordination. Architect, Engineer, or Owner will not be responsible for costs of necessary changes and additional work required by Contractor or any other trades.
5. Substitutions will not be permitted after bid opening.

B. Correspondence

1. Direct all correspondence concerning Division 26, 27, & 28 submittals to:

JEREMY FAIRAIZL
PRAIRIE ENGINEERING, P.C.
1905 17TH ST SE
MINOT, ND 58701
jfairaizl@prairieengineeringpc.com

C. Shop Drawings

1. Before any of the materials are delivered to the job, submit to Engineer via the Prime Contractor complete Shop Drawings for each item indicated. (Minimum six copies).
2. Include catalog numbers, performance data, dimensions and other descriptive information.
3. Shop Drawings may be in the form of printed catalog sheets showing all necessary information and shall be **completely indexed and tabbed, and be bound in Duo-Tang, Mead or equivalent folders**. Electronic submittals shall be in PDF format organized in similar fashion.
   a. When multiple models are included on the sheets, the information for the exact submitted model shall be clearly indicated and/or highlighted.
4. Each Shop Drawing folder shall be **stamped, initialed, and dated**, by Prime Contractor to indicate he has thoroughly reviewed them in accordance with General Conditions. Electronic submittals shall include similar cover sheet attachment in PDF format. **Email message text not acceptable.**
5. Shop Drawings not in conformance with Specification will be returned to Prime Contractor without review.
6. Two copies will be retained by Engineer after review and balance will be returned to Prime Contractor.

D. As-Built Drawings

1. Designate one set of clean blueprints at project site as As-Built Drawings. Make As-Built Drawings available to Engineer during project visitation.
2. As work progresses, Contractor's field supervisor shall mark As-Built Drawings in red pencil to indicate actual conditions of installation.
3. Show same general details as Drawings.
4. Give particular attention to marking actual locations of feeders and underground runs.
5. Affix all addendum and change order descriptions to appropriate as-built drawing sheet, utilizing spray adhesive.
6. Submit As-Built Drawings to Engineer along with Record Manuals at close of project.
7. Upon Engineer's review, provide **additional three** photocopies of As-Built Drawings.

E. Record Manuals

1. Upon completion of Work of this Division and as condition of its acceptance, Contractor shall compile three Record Manuals in loose-leaf hardcover binders.
2. List project name, date, Contractor's name, address and telephone number on exterior label of each Record Manual.
3. Include an index sheet indicating each major piece of equipment, supplier and supplier's telephone number. Provide tabbed dividers indicating major groupings of equipment.
4. Record Manual information shall be included for all equipment/material where Shop Drawings are required. **Also include all installation, operation and maintenance data packaged with any equipment.**

5. Turn over to Owner all spare equipment and devices specified and shown. List quantities on contractor letterhead or invoice, obtain signature of Owner's representative acknowledging receipt, and include with each Record Manual.
6. Include one copy of formal instructional recordings, properly identified as to specification section.
7. Include copy of State Electrical Board Wiring Certificate in each Record Manual.
8. Include service equipment fault current calculation and step-down transformer fault current calculations in record manuals. Utility transformer fault current shall be calculated per Section 260553-3.3. Step-down transformer fault current shall be calculated per Section 262200-1.2. Provide in tabular form, as per the following example:

Transformer	kVA	Sec. Voltage	Phase	Impedance	Fault Current	Date Calculated
Utility	300	480	3	1.06%	34,043 amps	11/15/2016
T-1	150	208	3	3.8%	10,958 amps	11/15/2016

9. Calculate the available fault current (AFC) for the mechanical and electrical equipment listed and provide the information in tabular form, utilizing naming convention on the drawings.
   a. HVAC Equipment 1HP and larger
   b. Refrigeration Equipment
   c. Elevator Equipment
   d. Industrial Control Panels
   e. Electrical Distribution Equipment
   f. Branch Panelboards
   g. MCC's.

10. Fault Current Table Format Example:

Equipment	Voltage	Phase	AFC at Equip.	Date Calculated
AH-1	480	3	5,289 amps	11/15/2016
CU-1	208	3	2,321 amps	11/15/2016

11. Transformer fault current table and equipment fault current calculation table shall be grouped together in the same tabbed section of the record manuals.

1.5 QUALITY ASSURANCE

A. Qualifications of Installers

1. For installation and testing, use only trained licensed and experienced workmen familiar with items required and manufacturer's recommended methods.
2. In acceptance or rejection of installed work, no allowance will be made for lack of skill on the part of the workmen.
3. To the maximum extent possible, retain the same supervisory personnel throughout the duration of the Work.

B. Licenses, Permits, Codes and Standards

1. Materials, workmanship and installation: comply with the latest editions of all applicable codes, local ordinances, industry standards, utility company regulations, insurance carrier requirements and these Specifications.
2. Codes and standards shall include, but not necessarily be limited to, the following:
   a. Underwriters Laboratories (UL) or other Nationally Recognized Testing Laboratory (NRTL)
   b. National Electrical Code (NEC)

c. National Fire Protection Association (NFPA)
d. Occupational Safety and Health Act (OSHA)
e. State and local wiring standards
f. Building and fire codes

3. The more stringent provisions shall govern where provisions of pertinent codes and standards conflict with these Specifications or Drawings. Where Codes, Specifications or Drawings differ with one another, the Contractor will be deemed to have bid the more expensive method. Refer all such discrepancies to the Engineer immediately.
4. Pertinent codes and standards shall not be cited to furnish less than specifically shown or specified.
5. Obtain and pay all permits, inspections, licenses and other charges pertaining to the Work. Upon completion of the Work, furnish proof of acceptance by proper agency having jurisdiction.

1.6 GUARANTEE AND WARRANTY

A. Unless otherwise modified by other sections of this specification, contractor shall guarantee materials, workmanship and the proper operation of equipment for a period of one year. Warranty period shall begin at date of substantial completion, or date of specific equipment commissioning, whichever is later. Contractor shall correct all equipment, material and workmanship found to be defective or non-conforming to the contract documents without cost to Owner.

B. Guarantee shall include trips to the project site by Contractor to adjust electrical equipment as required, ensuring it is operating as intended.

C. Specified guarantee shall not relieve Contractor from liability arising from improper installation or non-compliance with applicable codes.

D. Contractor shall include written warranty statement, indicating start and end dates of warranty period. Warranty statement shall be included with each copy of the Record Manuals.

1.7 CHANGES TO CONTRACT

A. Any required changes to the contract after bid date shall be in accordance with General Conditions/Division 1 and this section. Where any discrepancies between the sections are encountered, the more restrictive section shall apply.

B. Proposed changes shall be accompanied with complete substantiating documentation.

1. Provide an itemized list of quantities for materials, equipment, and supplies.
   a. Include unit costs for each item and extended price.
   b. Include unit labor for each item and extended time.
2. Provide subcontractor proposals that include the same substantiating documentation.
3. Provide quotations from suppliers for any specially ordered equipment.

C. Material costs shall be actual costs to the contractor, obtaining the materials through normal supply channels, including trade and quantity discounts. Utilizing “suggested pricing” from national pricing organizations for unit costs shall not be accepted. Upon request, the contractor or subcontractor shall submit evidence to substantiate the costs.

D. Labor units shall be industry accepted standard labor hours to perform one unit of work. If the work is being performed in a location that is not considered to be standard working conditions for that specific task, additional labor shall be itemized.

E. Labor rates shall be the actual rate paid for the workman category along with associated labor burden. Labor burden shall consist only of the mandatory fringe benefits, labor taxes, and labor insurances as affected by payroll. The owner reserves the right to reject any labor burden which is inconsistent with other similar contractors or where the fringe benefit cost is in excess of established labor agreements.

F. Allowable markups for contractor and subcontractors
   1. Overhead on work performed by own forces: 12% maximum.
   2. Profit on work performed by own forces: 10% maximum.
   3. Commission on work performed by Subcontractors: 5% maximum.
   4. Sales tax.
   5. Bond and permit increases where applicable.

G. No additional markups shall be allowed for:
   1. Field and/or office supervision/administration time.
   2. Tool burden.
   3. Shop burden.
   4. Overhead/Profit applied to work performed by others.

H. Additional costs for travel and subsistence shall only be allowed if the proposal includes a request for extension of the completion date. Furthermore, those costs shall be proportional to the number of working days of the extension.

I. Subcontractors shall compute their costs in the same manner as the contractor. Subcontractors are subject to the same markup constraints as described herein.

J. For changes resulting in credit to the costs, no restocking fees for materials shall be applied by the contractor or subcontractors.

1.8 TEMPORARY FACILITIES

A. Refer to Special Conditions and/or Division 1 for details of temporary facilities.

1.9 APPLICATIONS FOR PAYMENT

A. Refer to Division 1 “Applications for Payment”.

B. Provide one additional copy, sent directly to the Engineer.

C. Format and content:

   1. When included with the Bid, the following categories shall be indicated on the application for payment:
      a. *Project mobilization.*
      b. *Demolition*.
      c. *Service & Distribution* (all switchgear, panels, transformers, motor control centers, and loose control/disconnects, installed in place).
      d. *Lighting* (all fixtures and lamps, installed in place, including pre-fabricated wiring system).
      e. *Wiring Devices* (all switches, receptacles, and plates, except voice-data, installed in place).
      f. *Equipment Connections* (HVAC, elevator, food service, etc, connected in place).
      g. *Basic Materials* (all conduit, wire, boxes, supports, fittings, grounding materials, except special systems and voice-data cabling systems, installed in place).
      h. *Fire Alarm & Detection* (all system equipment, installed in place).

i. *Special Systems* (all system equipment and cabling, installed in place, broken out by Specification Section. Examples include Clock and Program, Intercom, Nurse Call, Public Address, Sound Reinforcement, Rescue Assistance, TV Signal Cabling, Architectural and Theatrical Lighting Controls, and the like).
j. *Generator* (all system equipment, installed in place).
k. *Voice-Data Cabling Systems* (all system equipment, installed in place).

PART 2 – PRODUCTS

2.1 MATERIAL

A. Material and equipment shall be as shown or specified. Provide material not specifically described but required for a complete and proper installation of the Work, subject to the acceptance of the Engineer.

B. All material and equipment shall be new when delivered to the job and be listed by a Nationally Recognized Testing Laboratory (NRTL).

C. Owner will not be liable for material installed in non-compliance with codes, standards, and these Contract Documents.

2.2 PRODUCT HANDLING

A. Protection

1. Use all means necessary to protect the materials of this Division before, during and after installation and to protect the installed work and materials of all other trades.

B. Replacements

1. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

PART 3 – EXECUTION

3.1 GENERAL

A. Engineer, Architect, or Owner shall not be responsible for the means, methods, techniques, sequences or procedures of construction selected by Contractor.

B. Engineer, Architect, or Owner shall not be responsible for safety precautions and programs incidental to work of Contractor.

C. It is the sole responsibility of Contractor to initiate, maintain, and supervise all safety precautions and programs in connection with the Work.

3.2 SURFACE CONDITIONS

A. Prior to work of each Section of Division 26, 27, & 28, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

B. Verify that work of this Division may be installed in accordance with all pertinent codes, regulations and standards.

3.3 COORDINATION

A. Order material in a timely fashion to assure it is on the job site when required.

B. Coordinate installation of material with schedule of other trades to prevent unnecessary delay in construction schedule.

3.4 DISCREPANCIES, CONSTRUCTION CONFLICTS AND DRAWINGS

A. Discrepancies

1. Prior to submitting bid, Contractor shall refer any apparent discrepancies or omissions to Engineer for clarification.
2. The Architect, Engineer or Owner will not be responsible for any oral instructions or modifications to the contract documents prior to opening of bids.
3. Written interpretation or clarification will be made by Addenda.

B. Construction Conflicts

1. Conflicts discovered during construction shall be immediately called to the attention of the Engineer for decision.
2. Do not proceed with installation in area of question until conflict has been fully resolved.
3. When so directed by Engineer, Contractor shall make minor adjustment to avoid interferences with other trades. Such minor adjustments shall be performed at no additional cost to the Architect, Engineer or Owner.

C. Drawings

1. Drawings indicate extent and general layout of electrical systems for project. Due to small scale, it is not possible to indicate all fittings and accessories that may be required. Provide such fittings and accessories as required to form a complete and operating system in general conformance with Specifications and Drawings.
2. Data indicated on Drawings and in these Specifications is as exact as could be secured, but absolute accuracy is not guaranteed.
3. Exact locations, distances, levels and other conditions will be governed by the structure. Field measurements shall take precedence over the Drawings. Use the Drawings and these Specifications for guidance. Secure the Architect's approval for all changes in locations.
4. Verify all measurements at site. No compensation will be made because of difference between locations shown on the Drawings and measurements at the building.
5. Refer to the architectural drawings for dimensions and locations of walls, partitions, doors, windows, ceiling heights, door swings and other details of construction.

3.5 UNDERGROUND UTILITIES

A. Locations of existing underground utilities are based on available site information and are shown approximately. Contractor shall determine exact utility locations before commencing work and shall be responsible for repair of damages resulting from his construction activities.

B. Trench and backfill for installation of underground conduits to depth shown or required. Remove any accumulated water in excavation by pumping. Shore and brace excavation as required by safety regulations. Provide temporary bridges to maintain normal traffic flow. Excavation and backfill required by electrical installations shall be accomplished in accordance with Earthwork Specifications by this Contractor.

3.6 CUTTING AND PATCHING

A. Carefully lay out all work in advance to minimize cutting, channeling or drilling.

B. Where necessary, all such cutting and patching shall be done in a manner approved by Architect.

C. Restore damaged surfaces to their original condition by skilled mechanics of the trade involved. Contractor at fault shall assume all cost.

D. Use only rotary type drilling tools to cut concrete.

E. Do not endanger the stability of the structure. Do not at any time cut or alter work of any other Contractor without Architect's consent.

3.7 TESTS

A. Perform all tests as required by Engineer during construction and as described in other Sections of these Specifications.

B. Testing of entire installation shall be completed before final inspection.

3.8 INSTRUCTIONS

A. After all required approvals of the Work have been obtained; demonstrate the operation and maintenance of all electrical equipment to the Owner's personnel.

B. Provide written and oral operating and maintenance instructions to Owner's representatives. The oral instructions shall be given before the Owner occupies the buildings. Instructions to include all building's electrical systems and equipment.

C. Copies of written operating and maintenance instructions shall be included with each Record Manual.

D. Electrical Contractor shall coordinate with Owner at Owner's convenience, formal instruction time for contractor personnel to instruct Owner's Representatives on all equipment. Provide similar equipment supplier's instructions where specified thus. Formal instruction to occur with each Record Manual, being referenced to and a part of the Manual.

E. Formal instructions shall be recorded when required by other Sections of this Specification by this Contractor. Format shall be digital media capable of being played on Windows or Mac operating systems, or shall be submitted on DVD. Digital media may be submitted on a flash drive that is rendered un-writable after the video instructions have been uploaded.

3.9 CLEAN UP

A. Remove all scrap material left on job during and after installation of Work.

B. All equipment having finished paint surfaces shall be examined upon completion for scratches and other damage. Touch up all surfaces as required with paint of color to match factory finish.

C. Perform all cleaning as required by other Sections of Division 26, 27, & 28.

END OF SECTION

SECTION 260510 – REMODELING WORK

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide work in remodeled area as shown on Drawings and Specifications.

B. Existing Conditions

1. Visit existing buildings before submitting bid and become familiar with all pertinent existing conditions. Make allowance in bid for all pertinent existing conditions. No Change Orders will be issued:
   a. For Contractor's failure to visit site and acquaint himself with existing conditions.
   b. For any portion of remodeled work necessary for complete installation of systems shown.
   c. Due to Contractor's lack of understanding of amount of work or difficulty of work involved.

PART 2 – PRODUCTS

2.1 See following sections of this Specification.

PART 3 – EXECUTION

3.1 GENERAL

A. Wiring in existing building shall remain except as noted on Drawings or specified.

B. Verify existing conditions relative to work involved and make allowances thereto.

C. Balance additional loads to existing circuitry between phases.

D. Furnish a revised, typed panel directory on existing panelboards where circuitry is changed.

3.2 CUTTING AND PATCHING

A. Carefully lay out all work in advance to minimize cutting, channeling or drilling.

B. Where necessary, all such cutting and patching shall be done in a manner approved by Architect.

C. Restore damaged surfaces to their original condition by skilled mechanics of the trade involved. Contractor at fault shall assume all costs.

D. Use only rotary type drilling tools to cut concrete.

E. Do not endanger the stability of the structure. Do not at any time cut or alter work of any other Contractor without Architect's consent.

3.3 REMOVAL AND/OR REUSE OF EXISTING MATERIALS AND EQUIPMENT

A. Remove or relocate existing conduits, wires, equipment, devices or fixtures indicated on Drawings or as required.

B. Remove any existing non-active voice/data cables including trunk cables, and any other special systems cables in the entirety. Verify with Owner prior to removal.

C. Remove any existing exposed abandoned raceways, including those above accessible ceiling finishes in their entirety. Verify with Owner prior to removal. Where complete conduit removal is not feasible, cut conduit flush with walls and floors, and patch surfaces.

D. Provide additional code-mandated supports on any remaining (existing prior to project and located within the remodel area) unsupported raceway systems or communications cabling including fiber optic, voice/data and special systems.

E. Where existing multi-wire lighting and power branch circuits are modified in any way, it is this Contractor's responsibility to provide additional grounded (neutral) conductors as required between the electrical panelboard and existing circuit devices. Circuit breaker tie-handles are not acceptable. In the event that existing raceways are not properly sized to accommodate the required additional conductors, new raceway shall be installed.

F. Where the reuse of existing conduits, wires, and devices, or fixtures is permissible, verify that wiring is continuous. Existing outlet or junction boxes shall not be rendered inaccessible by structural changes made to the building.

G. Verify that no devices are cut off from power source unless specifically noted.

H. Existing equipment which is indicated as being removed and not indicated for reuse shall remain the property of the Owner, stored as directed. Remove and dispose any material the Owner does not wish to retain, except fluorescent lamps and ballasts.

I. Do not break, dump or otherwise destroy removed fluorescent and HID lamps, due to possible mercury contamination. Removed lamps are to be recycled and converted by an EPA-Licensed company regularly engaged in this business, and offering this service in accordance with all EPA, State, and Local Regulations:

Green Lights Recycling, Inc.
10040 Davenport Street NE
Blaine, MN 55449
(763) 785-0456

Recycle Technologies
4000 Winnetka Ave. N
Minneapolis, MN 55427
(800) 969-5166

Waste Management Lamp Tracker, Inc.
10050 Naples St NE
Blain, MN 55449
(800) 664-1434

or equivalent as selected by the Contractor.

All associated recycling costs shall be included in this Contract. Recycler shall provide Owner with a Certificate of Conversion, indicating Owner's manifested lamps have been properly recycled and converted. Comply with recycler's packing and shipping instructions.

J. Do not dump or otherwise destroy removed ballasts, due to possible PCB contamination. Removed ballasts are to be destroyed by an EPA Licensed company regularly engaged in this business, and offering this service in accordance with all EPA, State, and Local Regulations:

Green Lights Recycling, Inc.
10040 Davenport Street NE
Blaine, MN 55449
(763) 785-0456

Recycle Technologies
4000 Winnetka Ave. N
Minneapolis, MN 55427
(800) 969-5166

Waste Management Lamp Tracker, Inc.
10050 Naples St NE
Blain, MN 55449
(800) 664-1434
or equivalent as selected by the Contractor

All associated destruction costs shall be included in this Contract. Recycler shall provide Owner with a Certificate of Destruction, indicating Owner's manifested ballasts have been properly destroyed. Comply with packing and shipping instructions.

K. Assume existing equipment and fixtures shown to be reused are in good working condition and can be installed without any repairs or, if in unusable condition, notify the Architect for decision. Contractor shall be responsible for any damage by his personnel to equipment in removal or handling.

L. Provide blank plates as required at existing rough-ins not being re-used.

M. Clean fixtures and other equipment removed and indicated for reuse. Provide new lamps for reused fixtures.

3.4 CONTINUITY OF SERVICE

A. Existing building will be in use during construction. Schedule and carry out work for a minimum of inconvenience to the Owner.

B. All service interruptions shall require a prior approval by Owner. Confine interruptions to the smallest area possible.

C. Verify that automatically controlled, electrically operated equipment is returned to the same operating condition which existed prior to interruption.

3.5 ASBESTOS

A. Contractor is assumed to be knowledgeable about Federal, State, and Local requirements with respect to asbestos issues.

B. Avoid disturbance of any asbestos-containing material (ACM) within the construction area or elsewhere on the site.

C. Verify with Owner's "Asbestos Survey and Management Plan" the extent (if any) of existing asbestos.

END OF SECTION

SECTION 260519 - CONDUCTORS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide a complete system of conductors enclosed in a raceway.

1.2 SUBMITTALS

A. Record Drawings

1. Maintain accurate record drawings in accordance with Section 260500.

PART 2 – PRODUCTS

2.1 CONDUCTOR

A. Copper

1. Soft drawn, annealed.
2. Conductivity of not less than 98% pure copper.
3. Insulated for 600 volt service.
4. #10 AWG and smaller: Solid, THWN/THHN.
5. #8 AWG and larger: Stranded, THWN/THHN.
6. Provide USE where required by Code.

B. Aluminum

1. Electrical grade aluminum alloy conductor material.
2. Insulated for 600 volt service.
3. #1/0 AWG and larger: Compact stranded, THWN/THHN or XHHW-2.
4. Provide USE where required by Code.
5. Manufacturer: Alcan Stabiloy Series or equivalent.

C. MC Cable

1. MC cable is not acceptable for use as a wiring method.

2.2 VARIABLE FREQUENCY DRIVE (VFD) CABLE

A. Non-armored, Type TC cable with 85 percent tinned copper braid, 100 percent foil shield, and full size copper drain wire.

B. XLPE conductor insulation for 600 volt service.

C. Manufacturer: Belden 29500 series or equivalent.

2.3 SPLICES

A. #10 AWG and smaller: Scotchlock Y, R or G as manufactured by 3M Company, or equivalent.

B. #8 AWG and larger: Compression type, as manufactured by Anderson, Burndy, Thomas and Betts Company, or equivalent.

2.4 LUBRICANT

A. General

1. NRTL-listed.
2. Flame resistant
3. Compatible with conductor insulation.

B. Acceptable Manufacturer

1. As selected by Contractor.

PART 3 – EXECUTION

3.1 INSTALLATION

A. General

1. Install in accordance with Code, product listing, and manufacturer's recommendations.
2. Install wire and cable in Code-conforming raceways after moisture and debris is swabbed from conduit.
3. Refer to system specified for conductor's peculiar to that system.
4. Conductor sizes: Standard AWG, #12 minimum unless otherwise indicated.
5. Fixture taps: minimum #16 AWG.
6. Conductor temperature ratings: Compatible with the equipment to which it is to be connected. Refer to product listing.
7. Make conductor length for parallel feeders identical.
8. Derate ampacities as required for high ambient temperatures or conductor fill.

B. Color

1. Multi-wire (shared neutral) circuits.
   a. 120/208 volt
      1) Phase conductors: Black, red or blue.
      2) Grounded conductor (neutral): White.
      3) Grounding conductor: Green or bare.
   b. 277/480 volt
      1) Phase conductors: Brown, orange or yellow
      2) Grounded conductor (neutral): Gray
      3) Grounding conductor: Green or bare.
2. Separate neutral circuits:
   a. 120/208 volt
      1) Phase conductors: Black, red or blue.
      2) Grounded conductor (neutral): White with stripe colored to match phase.
      3) Grounding conductor: Green or bare
   b. 277/480 volt

1) Phase conductors: Brown, orange or yellow.
2) Grounded conductor (neutral): Gray with stripe colored to match phase.
3) Grounding conductor: Green or bare

3. Switch legs: Same as phase conductors.
4. 120 volt isolated ground circuits:
   a. Phase conductor: Orange.
   b. Grounded conductor (neutral): White with orange stripe.
   c. Grounding conductor: Green with yellow stripe.

C. Splices

1. Eliminate wherever possible.
2. Made only at outlet or junction boxes.
3. Obtain special permission from Engineer for any splices in feeder conductors.

D. Voltage Drop

1. Increase size of circuit wiring in accordance with NEC 210.19(A)(1), fine print note, No. 4.
2. Use #10 AWG minimum for all home run conductors longer than 75 feet on 120/208/240 systems and 150 feet on 277/480 systems.

E. VFD Cable

1. Install cable from load terminals of VFD to motor.
2. Enclose cable in raceway system (conduit and flexible conduit).
3. Terminate the drain wire to the ground lug at both the VFD and the motor

F. Aluminum Conductors

1. Unless otherwise indicated, all references on these Drawings are for copper conductors. At Contractor's option, aluminum conductor sizes #6 AWG and larger may be substituted in service and panel feeder runs provided all of the following conditions are met:
   a. Conductor and raceway size increased to the same or greater capacity rating.
   b. Install aluminum conductors in strict accordance with current editions of UL Standard 486A-486B “Wire Connectors”, American National Standard NECA/AA 104 “Aluminum Building Wire and Cable”, Aluminum Association Publication 51 "Aluminum Building Wire Installation Manual and Design Guide", specific manufacturer’s instructions included with equipment, and this specification.
   c. Terminate aluminum conductors in accordance with referenced Standards, including, but not limited to the following operations:
      1) Use listed AL7CU or AL9CU connectors sized to accept aluminum conductors to the ampacity specified.
      2) Using a suitable stripping tool to avoid damage to the conductor, remove insulation from the required length of the conductor.
      3) Wire brush the conductor and apply a listed joint compound.
      4) Tighten the connection per the connector manufacturer’s recommendations.
      5) Wipe off any excess joint compound.
      6) Retighten all connections to recommended torque levels immediately prior to Final Project Visitation.

3.2 TESTS

A. After equipment and wiring is installed, and before it is energized, test all power circuits with a megohmeter for insulation resistance, phase-to-phase and phase-to-ground faults.

B. Before testing, disconnect all equipment that might be damaged by the test voltages.

END OF SECTION

SECTION 260526 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Bond and ground all electrical equipment in accordance with National Electrical Code, State/Local Codes, these Specifications and as shown on Drawings.

B. Description of System

1. The service equipment, conduit systems, supports, cabinets and neutral conductor shall be solidly grounded and bonded in accordance with National Electrical Code to form a permanent effective and continuous grounded system.

PART 2 – PRODUCTS

2.1 GROUND RODS

A. Steel with a metallically bonded outer layer of electrolytically applied copper.

B. Minimum 1/2" diameter 10 foot length, unless otherwise indicated.

C. Sectional rods not permitted.

D. Manufacturer: ERITECH or equivalent.

2.2 GROUND ROD CLAMPS

A. Ground rod clamps shall be high strength silicone bronze.

B. Manufacturer: ERITECH or equivalent.

C. At Contractor's option, exothermic welding (CADWELD) or impact compression (ERITECH Hammerlock) may be used in place of ground rod clamps.

2.3 WATER PIPE GROUND CLAMPS

A. Steel U-bolt with bronze saddle.

B. Thomas and Betts Company 3900 series or equivalent.

2.4 REBAR GROUND CLAMPS

A. Bronze alloy construction.

B. Sized as required by rebar stub out.

C. Eritech RC or EK series as required by local authority. Equivalent products by Thomas and Betts acceptable.

PART 3 – EXECUTION

3.1 GENERAL

A. **Grounding conductors not shown or included on floor plans.**

B. **When required, increase trade size of raceway accordingly.**

C. Aluminum not acceptable for use as a grounding conductor.

3.2 SYSTEM GROUNDING

A. Provide grounding electrode system in accordance with NEC 250.50. If available, each of the items listed in 250.52(A)(1) through (A)(7) shall be bonded together to form grounding electrode system.

B. Connect grounding electrode conductor to grounded service conductor.

C. Provide raceway enclosing grounding electrode conductor. If metallic, bond as per NEC 250.64(E). Provide grounding bushing as required complete with jumpers same size as grounding electrode conductor.

D. To comply with NEC 250.53, provide two ground rods spaced minimum 6'-0" apart.

3.3 EQUIPMENT GROUNDING CONDUCTOR

A. Non-metallic conduit: Sized in accordance with NEC, except as further modified by this Specification.

B. Flexible Metal Conduit, Liquidtight Flexible Conduit.

1. Other than for connection of 120 volt recessed luminaires, not acceptable for use as means of grounding.
2. Provide bonding jumper sized in accordance with NEC around all flexible conduits. Use fittings having lugs for termination of jumper.
3. Spiral wrap not acceptable. Lay along surface, secured with cable ties.
4. Bonding jumper maximum length: 6'.
5. Bonding jumper not required where separate equipment grounding conductor is used.

C. Branch Circuits

1. **Separate equipment grounding conductor required for each raceway.**
2. Size: per NEC 250.122.
3. Bond to grounding bars, junction boxes and luminaire grounding screws.
4. Field install grounding screw in luminaire if not provided by factory.

D. Feeders

1. **Separate grounding conductor required.**
2. Bond to grounding bars in switchboards, panelboards and motor control centers.

3. Provide grounding bushing at both ends of all feeders utilizing metallic raceway.
    a. Bond to grounding bars at both ends.
    b. Size bonding jumpers to match equipment grounding conductor.
4. Feeder Equipment Grounding Conductor Size:
    a. Size per NEC 250.122.
    b. Copper equivalent ampacity when aluminum phase conductors utilized.
5. Do not splice grounding conductor.

E. Water Pipe System

1. Bond interior metal water piping per NEC Section 250.104(A) if water pipe system is not used as part of grounding electrode system.

END OF SECTION

SECTION 260533 - RACEWAYS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide all conduit systems as shown on Drawings or required by Codes and Specifications.

B. Description of System.

1. Provide code-conforming raceway system for all conductors unless specifically noted otherwise by phrase "not in conduit".

1.2 SUBMITTALS

A. Record Drawings

1. Maintain accurate record drawings for all raceway runs in accordance with Section 260500.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Metallic conduit and tubing: Allied Tube and Conduit, Republic Conduit, or equivalent.

B. Non-metallic conduit: Carlon Schedule 40 or Schedule 80 where required, Allied Tube and Conduit, Cantex Inc., or equivalent.

C. Flexible metal conduit: Aluminum.

D. Liquidtight, flexible metal conduit: Anaconda Sealtite or equivalent.

E. Fittings

1. Rigid metal conduit: Appleton, Crouse-Hinds, or equivalent**. Pot metal condulet fittings not acceptable.**
2. EMT:
   a. **Steel.**
   b. Setscrew or watertight as required.
   c. Thomas and Betts Company, or equivalent.
   d. **Pot metal, "Sock-on" and indentor fittings not acceptable.**
3. Flexible metal conduit: STEEL, Thomas and Betts Company XC-400 series, or equivalent.
4. Liquidtight flexible metal conduit:
   a. **Steel.**
   b. Straight or angled as required.
   c. Appleton, Thomas and Betts Company or equivalent.

F. Hangers and Supports

1. As required by Codes and Specifications.
2. Raco, Unistrut, or equivalent.
3. Erico conduit clips, Type 8-M, 12-M and K-8 acceptable for individual branch circuit runs.

G. Metal Surface Raceway

1. Wiremold 500/700 metallic series or equivalent, unless otherwise indicated on Drawings.
2. Provide associated fittings as required.
3. Standard color as selected by the Architect.

H. Wireway

1. NRTL 870 listing throughout, including connectors and fittings.
2. Hinged cover construction.
3. Sealing capability where required.
4. Suitable for "lay-in" installation of conductors.
5. Rust inhibiting phosphatizing undercoat and baked enamel finish.
6. Plated hardware.
7. Square D "Square Duct" or equivalent.

I. Expansion Fittings

1. Metallic: OZ, Thomas and Betts Company, or equivalent.
2. Non-Metallic: Carlon, or equivalent.

J. Firestop Assemblies

1. Firestop systems shall consist of fittings and/or intumescent materials assembled as per UL (or other NRTL) System Details.
2. Product manufacturers: 3M, Chase Technology Corporation, Dow Corning Fire Stop, Hilti, International Protective Coatings Corp. (Flame Safe), Nelson Fire Stop Systems.

K. Thru Wall and Floor Seals

1. OZ-Gedney Type "FSK" or equivalent.

PART 3 – EXECUTION

3.1 INSTALLATION

A. General

1. Electrically continuous throughout.
2. Plumb and level.
3. Cut square and reamed smooth.
4. Use commercial bender for offsets and bends.
5. Cap to prevent debris from entering during construction.
6. Swab conduit prior to installation of conductor.
7. Provide pull cord in empty conduits.
8. Alter conduit routing to avoid structural obstructions, minimizing crossovers.

9. It is the intent of this Specification to provide reasonable provisions for future expansion of electrical use (See NEC 90.8 and 90.1(B), FPN). Therefore, **install all branch circuit home runs as shown on Drawings. Do not combine home runs or increase quantity of conductors therein.**
10. Install raceway, conduit and fittings in accordance with Code, NRTL listing and manufacturer's recommendations.

B. Concealed Interior Raceway

1. Conceal all raceway within building construction.
2. May be run in a direct line for Contractor's convenience.
3. For Contractor's convenience, **concealed** stubs from concrete-encased PVC conduit runs may extend to first **concealed** junction box.
4. Where applicable, center within insulation any electrical conduit routed in attic space. Provide sealing as per NEC 300.7(A) for all conduits exposed to different temperatures.

C. Exposed Interior Raceway

1. Use limited to mechanical and electrical equipment rooms, motor connections, and panelboards scheduled as surface.
2. Shall not be used in finished area.
3. Run parallel or perpendicular to building lines.
4. **Provide RGSC or EMT stubs for concrete-encased PVC conduit runs.** Extend stub from RGSC coupling set flush in floor.
5. Provide flexible conduit as required for motor and equipment connections.

D. Concrete Encased Raceway

1. Shall not interfere with structural integrity of slab, column, or beam.
2. Installation subject to acceptance of Structural Engineer.
3. Maximum diameter 1/3 thickness of concrete member.
4. Install in center of section.
5. Provide expansion fitting when crossing building expansion joint. Grounding integrity of raceway to be maintained.

E. Exterior Raceway

1. Minimum 24" below grade.
2. PVC unless otherwise indicated.
3. **Exterior surface stubs for PVC conduit runs: RGSC, including final underground sweep.** Exterior surface stubs acceptable only where specifically shown.
4. Penetrating Watertight Walls or Floors: Provide block-out with 1/2" clearance around conduit for underground penetrations. Pack with Oakum and caulk with non-shrinking grout, or provide conduit entrance seal.
5. Penetrating Roof or Waterproofing Membranes: Provide flashing and pitch pocket.
6. Contractor responsible for providing a watertight penetration.
7. Coat RGSC penetrations with heavy asphaltic-base compound.
8. Unless otherwise indicated, route exterior conduits to interior distribution equipment concealed under slab.

F. Supports

1. Refer to NEC 300.11
2. **Tie wire supports not acceptable.**

3. Support Spacing: NEC.

G. Specific Locations

1. Allow 6" minimum clearance at flues, steam pipes and heat sources.
2. Conduit visible behind grills and registers: paint black.
3. Seal conduit where leaving heated area and entering unheated area.
4. Penetrating non-watertight walls or floors: Pack space between conduit and block-out on both sides with Oakum.
5. Penetrating fire rated walls or floors: Seal to prevent passage of fire or products of combustion.
6. From each flush mounted panel location, stub three additional 3/4" conduits into nearest accessible ceiling space.
7. Do not mount raceway on ductwork, cover access doors, panels, controls, or otherwise hinder normal maintenance and repair of the equipment.
8. Motors:
   a. Connect to motor feeder or branch circuit by means of flexible metal conduit or liquidtight flexible metal conduit in moist areas.
   b. Minimum flexible length: 18".
   c. Where practical, feed floor mounted motors from raceway installed in or under slab.
   d. When floor mounted motors are fed overhead, provide required support for raceway. Extend raceway to floor and provide a floor flange. Insert "T" condulet fitting at proper height and extend flexible conduit to motor.

H. Specific Systems

1. Life Safety Branch
   a. All raceway systems except those embedded directly in earth or concrete, or surface metal raceway systems (wiremold), shall be externally identified by permanent YELLOW paint suitable for the purpose to easily distinguish from other power raceway systems. Items shall be painted prior to installation. In addition to field painted conduit, factory painted conduit as manufactured by Allied Tube & Conduit or equivalent is acceptable.

2. Critical Branch
   a. All raceway systems except those embedded directly in earth or concrete, or surface metal raceway systems (wiremold), shall be externally identified by permanent ORANGE paint suitable for the purpose to easily distinguish from other power raceway systems. Items shall be painted prior to installation. In addition to field painted conduit, factory painted conduit as manufactured by Allied Tube & Conduit or equivalent is acceptable

3.2 SIZE

A. National Electrical Code, subject to stated minimums.

B. Minimum Size

1. Exterior raceway: 3/4".
2. In or under poured concrete (including precast concrete panels): 3/4".
3. Branch circuit home run: 3/4". Consider home run to include raceway length from panelboard, switchboard, or motor control center to nearest power consuming or switching device on that circuit.
4. Feeders: 3/4".
5. All others not listed: 1/2".

3.3 TYPE

A. Intermediate Metal Conduit (IMC)

1. May be used in place of rigid galvanized steel conduit for Contractor's convenience.
2. Comply with manufacturer's recommendations for bending, threading and cutting operations.
3. Install as specified for rigid galvanized steel conduit.

B. Rigid Galvanized Steel Conduit (RGSC)

1. Use:
   a. Overhead electric and telephone service entrance. IMC or Aluminum not acceptable for this application.
   b. All raceway exposed to weather. Aluminum not acceptable for this application.
   c. Where required by national, state and local codes.
2. Fittings: Threaded except at KO type boxes where double locknut/bushing method acceptable.
3. Waterproof entire length with heavy asphaltic base compound when:
   a. Embedded directly in earth.
   b. Embedded in concrete directly in contact with earth, with or without vapor barrier.
   c. Penetrations run directly from concrete with earth, to soil burial.
4. Factory applied PVC coating acceptable in place of asphaltic base compound.

C. Rigid Non-Metallic Conduit (PVC)

1. Use only in slabs and exterior underground locations. See 3.1 B3, C4 and E3 for limitations.
2. Provide insulating bushing at all terminal adapters.
3. Provide equipment grounding conductor within raceway.
4. Increase trade size accordingly for equipment grounding conductor.
5. Utilize commercial heating element type bending equipment. **Do not use torches to bend PVC conduit.**

D. Electrical Metallic Tubing (EMT)

1. Use in all areas not prohibited by NEC and this Specification.
2. Do not use in concrete slabs on or under grade, or walls under grade.
3. Do not use in exterior underground applications.

E. Flexible Metal Conduit

1. Use for connections to transformers, motors, fixed appliances, recessed luminaires and other equipment as required.
2. Use liquidtight conduit with liquidtight fittings in areas of high moisture content.

F. Metal Surface Raceway

1. Install complete with matching boxes, fittings, and end caps, parallel or perpendicular to building construction.
2. Wire adjacent devices to alternate circuits where metal surface raceway contains devices integral to the channel.
3. Feed from flush connector in wall directly into raceway. Field cut base as required with 1/2" knockout for this purpose. Do not utilize Wiremold catalog #2051H for 2000/2100 series.

G. Fire Resistive Walls and Decks

1. Preserve integrity of fire rating through the use of UL (or other NRTL) Listed firestop assemblies of appropriate penetration type and rating time.
2. Install in accordance with manufacturer's recommendations.
3. All floor to floor penetrations and all wall penetrations into Mechanical, Electrical, and Communications Rooms shall be sealed with 1 hour firestop assemblies unless more stringent rating is required by building codes.
4. Include UL (or other NRTL) firestop assembly sheets and manufacturer product data sheets specifically used with the Project Closeout Documentation.

END OF SECTION

SECTION 260534 – OUTLET, PULL AND JUNCTION BOXES

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide all outlet, pull and junction boxes complete with associated covers and rings.

B. Work Installed But Furnished Under Other Directives.

1. Obtain manufacturer's backboxes or recommendations for special equipment.

1.2 SUBMITTALS

A. Record Drawings

1. Maintain accurate record drawings in accordance with Section 260500.

PART 2 – PRODUCTS

2.1 CEILING BOXES

A. Flush and Surface

1. 2-1/8" minimum depth.
2. Square or octagon as required.
3. Galvanized steel.
4. Manufacturer: Appleton, Raco, Steel City or equivalent.

2.2 WALL BOXES

A. Flush

1. One and two gang wall boxes: 4" square box, 2-1/8" minimum depth with appropriate plaster or tile ring.
2. More than three gang: Gangable 3-1/2" deep unless wall cavity limits depth to 2-1/2".
3. Use 4-11/16" square boxes where required by Code.
4. Single gang masonry boxes acceptable only for single conduit entrance. Feed-through circuiting not acceptable. Use 4" square box/tile ring for feed-through applications.

B. Surface Mounted Devices

1. 4" square box, 2-1/8" minimum depth with appropriate 1/2" raised cover.
2. Manufacturer: Appleton, B-Line, Raco, Steel City, Wiegmann, or equivalent.

C. **Sectional, through wall and handy boxes not acceptable.**

2.3 PULL AND JUNCTION BOXES

A. Galvanized steel with cover.

B. Size: National Electrical Code.

C. Manufacturer: Appleton, Raco, Hoffman, Shallbetter, Steel City, Wadsworth or equivalent.

PART 3 – EXECUTION

3.1 INSTALLATION

A. General

1. Install in accordance with code, product listing and manufacturer's recommendations.
2. Install boxes plumb, level and flush with finish surface.
3. Support securely and rigidly.
4. Verify wall depths to ensure adequate clearance for special backboxes.
5. Provide barriers in ganged switch outlets where voltage between adjacent switches exceeds 300 volts.

B. Location

1. Governed by structural conditions and obstructions.
2. Mount switch outlet on strike side of door, maximum 4" from door opening to first switch. Verify door swing with Architectural Plan.
3. Coordinate equipment outlets prior to installation for proper concealment.
4. Center outlets with respect to acoustical tile, paneling and furring trim.
5. Adjust outlets in masonry or tile construction to horizontal and vertical mortar joints.
6. Clear all piping, ductwork and other obstructions.
7. For outlet boxes on opposite sides of walls or partitions with separation distances of 24" or less, pack all interconnecting conduits with Duxseal after conductor installation, to prevent sound transmission.
8. Outlet boxes improperly located shall be corrected at Contractor's expense.

C. Mounting Heights

1. All device mounting heights shall conform to ADA Recommendations. Refer to Standard Electrical Symbol Legend for nominal mounting heights.
2. Verify height of all outlets to ensure installation above top of radiation covers, mirrors, counters and any other obstructions that may alter nominal mounting height.
3. **Measure from finish floor to centerline of outlet.**
4. Mount exterior outlets horizontally. Measure height from nearest interior finish floor below outlet.
5. Mount outlet designated AC (above counter) no less than 4" higher than top of countertop backsplash.

D. Fire Resistive Walls and Ceilings

1. Penetrations for steel electrical outlet boxes permitted, provided:
   a. Boxes do not exceed 16 square inches in area.
   b. Area of such openings shall not exceed 100 square inches for any 100 square feet of area.

c. Outlet boxes on opposite sides of walls or partitions separated by horizontal distance of 24 inches.

E. Pull and Junction Boxes

1. Pull and junction boxes are generally not indicated on Drawings.
2. Install in accordance with National Electrical Code and as required to facilitate wire pulling.
3. Do not install in finished spaces without approval of Engineer.

F. Identification

1. Identify pull and junction boxes containing system voltages in excess of 250 volts to ground with voltage markers.
2. Voltage markers: Not visible in finished areas.

END OF SECTION

SECTION 260536 – CABLE TRAY

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide cable tray systems as shown on Drawings.

2. Provide cable runway system from above data and server racks to cable entry locations about the room.

B. Description of System.

1. Provide complete cable tray system shown on Drawings and herein specified. System shall be of one manufacturer with all drop-outs, supports, and all other hardware required for a complete, acceptable, and approved system.

1.2 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500.
2. Indicate:
   a. Product dimensions
   b. Mounting details
   c. Support hardware

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Sizing and design based upon B-Line equipment. B-Line catalog numbers used for reference.

B. Other acceptable manufacturers: Cablofil, Snake Tray, Mono-Systems, Inc., WBT, or equivalent.

2.2 BASKET TYPE TRAY

A. ASTM A510 Grade 1008 steel construction with mesh size no larger than 2” x 4”.

B. All welds and edges smoothed free of burrs and sharp edges.

C. Zinc plated after fabrication.

D. Tray width and depth as noted on the project drawings.

E. Manufacturer: B-Line FT Series.

2.3 CABLE RUNWAY

A. Made from 1-1/2” x 3/8”, 16 gauge tubular steel.

B. Welded cross members at a maximum of 9 inch intervals.

C. Painted or plated finish.

D. Nominal 10’ section length.

E. Nominal 12 inch width.

F. Manufacturer: Snake Tray #CM-610 Series, Hoffman #LSSXXBLK Series, Middle Atlantic #CLB-10 Series, Cooper B-Line #SB17UXXB Series.

2.4 MISCELLANEOUS PRODUCTS

A. Firestop Assemblies

1. NRTL listed 4” square pathway with intumescent material designed to seal out fire, smoke, and toxic gases.
2. Quantity shall equal or exceed the width of the associated cable tray. i.e. a 6” wide tray requires two pathways.
3. Include mounting accessories as required by application specifics.
4. Manufacturer: EZ Path Series 44, 3M Model PT4SD or approved equal.

B. Equipment Grounding Conductors

1. Required in the dispatch and radio rooms (Room 103-105).
2. Bond in accordance with NEC 250.96, 250.102, and Telecommunications Bonding detail.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install in accordance with NEC and manufacturer’s instructions.

B. Coordinate installation to avoid conflicts with light fixtures, duct work, piping, or other mechanical equipment.

C. Provide backing for wall-mount track and support for ceiling-mount track as required.

D. No exposed hanger rod threads from bracket to a minimum of 6” above top of tray.

E. Fire Resistive Walls.

1. End cable tray within 6” of each side fire rated walls.
2. Install Firestop Assembly through rated wall as per manufacturer’s recommendations.

F. All floor to floor penetrations and all wall penetrations into Mechanical, Electrical, and Communications Rooms.

1. End cable tray within 6” of each side of penetration.

2. Install Firestop Assembly through floor or wall as per manufacturer's recommendations.

END OF SECTION

SECTION 260540 – FLOOR BOXES

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide floor boxes complete with devices, fittings and carpet flanges.

1.2 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500.
2. Show all details, including dimensions and service fitting repair parts.

B. Record Manuals

1. Submit information in accordance with Section 260500.
2. Include installation and maintenance instructions accompanying equipment.

PART 2 – PRODUCTS

2.1 CONCRETE FLOOR SLABS

A. Type A

1. Box
   a. Listed and evaluated by an NRTL to meet the applicable U.S. safety standards for scrub water exclusion when used on tile, terrazzo, wood, and carpet covered floors.
   b. Construction:
      1) Stamped steel with side and bottom knockouts from 3/4" to 1-1/4”.
         a) Provide optional 2” threaded hub adapter as required.
      2) Provide epoxy coating for specific installations where the box is in direct contact with earth.
   c. Fully adjustable, providing a maximum of 1-3/8” pre-pour adjustment and a maximum of 3/4” after-pour adjustment.
   d. Four independent wiring compartments that allow capacity for up to four duplex receptacles and/or communication services.
   e. Feed through removable barriers from adjacent compartments.
   f. Internal power and communication device brackets as required by specified internal device types and quantities. Provide internal blank plates for all unused compartments.
   g. Manufacturer: Wiremold #RFB4 series.
2. Activation Kit (Cover)
   a. Die cast aluminum flanged type trim ring with insert areas to allow for carpet and/or floor tile cutouts to match the finished floor; or flangless solid for tile or concrete type floor finishes.
   b. Finish: Black, Brass, Bronze, Nickel, Gray or Natural Aluminum as selected by the Architect.
   c. Manufacturer: Wiremold #FPCTC series or #FPBTXX series as selected by Architect.

B. Type B

1. Box
   a. Listed and evaluated by an NRTL to meet the applicable U.S. safety standards for scrub water exclusion when used on tile, terrazzo, wood, and carpet covered floors.
   b. Classified for use in 1, 1 1/2, and 2 hour fire rated floor systems.
   c. 4” round with two compartments.
   d. Construction:
      1) Stamped steel with integral intumescent firestop material.
      2) Insertion tabs to hold body in place without additional fasteners.
      3) Enamel finished interior.
   e. Device Plates and Accessories:
      1) One #4REC one 20 amp duplex prewired receptacle.
      2) One #4B blank mounting plate.
   f. Die cast aluminum, round activation cover.
      1) Surface mount flange to accommodate carpet floor finish.
      2) Finish as selected by the Architect.
         a) Powder coat finish: Black, Bronze, Gray, Brass, Nickel.
         b) Metallic finish: Brushed Aluminum.
   g. Manufacturer: Wiremold #4AT series.

C. Type C

1. Box
   a. Listed and evaluated by an NRTL to meet the applicable U.S. safety standards for scrub water exclusion when used on tile, terrazzo, wood, and carpet covered floors.
   b. Classified for use in 1, 1 1/2, and 2 hour fire rated floor systems.
   c. 8” round with five compartments.
   d. Construction:
      1) Stamped steel with integral intumescent firestop material.
      2) Insertion tabs to hold body in place without additional fasteners.
      3) Enamel finished interior.
   e. Device Plates and Accessories:
      1) One #68REC two 20 amp duplex prewired receptacles.
      2) One #8DEC decorator style mounting plate with two data jacks.
         a) If Panduit Mini-Com Modules are being supplied, provide Panduit #CFG series 4-module frame.
      3) One #8AAP two-gang communications mounting plate.
         a) Provide three 3-pin XLR jacks, Extron Model# 70-103-11, and one blank plate. Label both wall plate and floor jacks that are connected together.
      4) One #575CHA bottom housing assembly.
      5) One #5BLH bottom housing assembly.
      6) Three #1PTHA bottom housing assembly.
      7) One #175CHA-LJB bottom housing assembly.
      8) One #22CHA bottom housing assembly.
      9) One #1100CHA bottom housing assembly.
      10) One #8DIV 8” Divider.
   f. Die cast aluminum, round activation cover.
      1) Surface mount flange to accommodate carpet floor finish.
      2) Finish as selected by the Architect.
         a) Powder coat finish: Black, Bronze, Gray, Brass, Nickel.
         b) Metallic finish: Brushed Aluminum.
   g. Manufacturer: Wiremold #8AT series.

D. Type D

1. Box
   a. Listed and evaluated by an NRTL to meet the applicable U.S. safety standards for scrub water exclusion when used on tile, terrazzo, wood, and carpet covered floors.
   b. Classified for use in 1, 1 1/2, and 2 hour fire rated floor systems.
   c. 8” round with five compartments.
   d. Construction:
      1) Stamped steel with integral intumescent firestop material.
      2) Insertion tabs to hold body in place without additional fasteners.
      3) Enamel finished interior.
   e. Device Plates and Accessories:
      1) One #68REC two 20 amp duplex prewired receptacles.
      2) One #8CREST two gang decorator style device plate.
      3) One #8DEC decorator style mounting plate with four data jacks.
         a) If Panduit Mini-Com Modules are being supplied, provide Panduit #CFG series 4-module frame.
      4) One #575CHA bottom housing assembly.
      5) One #5BLH bottom housing assembly.
      6) Three #1PTHA bottom housing assembly.
      7) One #22CHA bottom housing assembly.
      8) One #8DIV 8” Divider.
   f. Die cast aluminum, round activation cover.
      1) Surface mount flange to accommodate carpet floor finish.
      2) Finish as selected by the Architect.
         a) Powder coat finish: Black, Bronze, Gray, Brass, Nickel.
         b) Metallic finish: Brushed Aluminum.
   g. Manufacturer: Wiremold #8AT series.

E. Type E

1. Box
   a. Listed and evaluated by an NRTL to meet the applicable U.S. safety standards for scrub water exclusion when used on tile, terrazzo, wood, and carpet covered floors.
   b. Classified for use in 1, 1 1/2, and 2 hour fire rated floor systems.
   c. 8” round with five compartments.
   d. Construction:
      1) Stamped steel with integral intumescent firestop material.
      2) Insertion tabs to hold body in place without additional fasteners.
      3) Enamel finished interior.
   e. Device Plates and Accessories:
      1) One #68REC two 20 amp duplex prewired receptacles.
      2) One #8ACT8A communications mounting plate.
      3) One #8TRAC communications mounting plate.
      4) One #8SER communications mounting plate.
      5) One #8DEC decorator style mounting plate with four data jacks.
         a) If Panduit Mini-Com Modules are being supplied, provide Panduit #CFG series 4-module frame.
      6) One #575CHA bottom housing assembly.
      7) One #5BLH bottom housing assembly.
      8) Three #1PTHA bottom housing assembly.
      9) One #175CHA-LJB bottom housing assembly.
      10) One #22CHA bottom housing assembly.

11) One #1100CHA bottom housing assembly.
12) One #8DIV 8" Divider.

f. Die cast aluminum, round activation cover.
1) Surface mount flange to accommodate carpet floor finish.
2) Finish as selected by the Architect.
a) Powder coat finish: Black, Bronze, Gray, Brass, Nickel.
b) Metallic finish: Brushed Aluminum.

g. Manufacturer: Wiremold Evolution series.

F. Type F

1. Box
a. Listed and evaluated by an NRTL to meet the applicable U.S. safety standards for scrub water exclusion when used on tile, terrazzo, wood, and carpet covered floors.
b. Classified for use in 1, 1 1/2, and 2 hour fire rated floor systems.
c. 8" round with five compartments.
d. Construction:
1) Stamped steel with integral intumescent firestop material.
2) Insertion tabs to hold body in place without additional fasteners.
3) Enamel finished interior.
e. Device Plates and Accessories:
1) One #68REC two 20 amp duplex prewired receptacles.
2) One #8ACT8A communications mounting plate.
3) One #8TRAC communications mounting plate.
4) One #8SER communications mounting plate.
5) One #8DEC decorator style mounting plate with four data jacks.
a) If Panduit Mini-Com Modules are being supplied, provide Panduit #CFG series 4-module frame.
6) One #575CHA bottom housing assembly.
7) One #5BLH bottom housing assembly.
8) Three #1PTHA bottom housing assembly.
9) One #175CHA-LJB bottom housing assembly.
10) One #22CHA bottom housing assembly.
11) One #1100CHA bottom housing assembly.
12) One #8DIV 8" Divider.
f. Die cast aluminum, round activation cover.
1) Surface mount flange to accommodate carpet floor finish.
2) Finish as selected by the Architect.
a) Powder coat finish: Black, Bronze, Gray, Brass, Nickel.
b) Metallic finish: Brushed Aluminum.
g. Manufacturer: Wiremold #8AT series.

G. Type G

1. Box
a. Listed and evaluated by an NRTL to meet the applicable U.S. safety standards for scrub water exclusion when used on tile, terrazzo, wood, and carpet covered floors.
b. Classified for use in 1, 1 1/2, and 2 hour fire rated floor systems.
c. 8" round with five compartments.
d. Construction:
1) Stamped steel with integral intumescent firestop material.
2) Insertion tabs to hold body in place without additional fasteners.
3) Enamel finished interior.

e. Device Plates and Accessories:
   1) One #68REC two 20 amp duplex prewired receptacles.
   2) One #8ACT8A communications mounting plate.
   3) One #8TRAC communications mounting plate.
   4) One #8SER communications mounting plate.
   5) Three #8DEC decorator style mounting plates.
      a) If Panduit Mini-Com Modules are being supplied for data devices, provide Panduit #CFG series 4-module frame.
   6) One #575CHA bottom housing assembly.
   7) One #5BLH bottom housing assembly.
   8) Three #1PTHA bottom housing assembly.
   9) One #175CHA-LJB bottom housing assembly.
   10) One #22CHA bottom housing assembly.
   11) One #1100CHA bottom housing assembly.
   12) One #8DIV 8" Divider.
f. Die cast aluminum, round activation cover.
   1) Surface mount flange to accommodate carpet floor finish.
   2) Finish as selected by the Architect.
      a) Powder coat finish: Black, Bronze, Gray, Brass, Nickel.
      b) Metallic finish: Brushed Aluminum.
g. Manufacturer: Wiremold #8AT series.

H. Type H

1. Box
   a. Listed and evaluated by an NRTL to meet the applicable U.S. safety standards for scrub water exclusion when used on tile, terrazzo, wood, and carpet covered floors.
   b. Classified for use in 1, 1 1/2, and 2 hour fire rated floor systems.
   c. 8" round with five compartments.
   d. Construction:
      1) Stamped steel with integral intumescent firestop material.
      2) Insertion tabs to hold body in place without additional fasteners.
      3) Enamel finished interior.
   e. Device Plates and Accessories:
      1) One #68REC two 20 amp duplex prewired receptacles.
      2) One #8ACT8A communications mounting plate.
      3) One #8TRAC communications mounting plate.
      4) One #8SER communications mounting plate.
      5) Three #8DEC decorator style mounting plates.
         a) If Panduit Mini-Com Modules are being supplied for data devices, provide Panduit #CFG series 4-module frame.
      6) One #575CHA bottom housing assembly.
      7) One #5BLH bottom housing assembly.
      8) Three #1PTHA bottom housing assembly.
      9) One #175CHA-LJB bottom housing assembly.
      10) One #22CHA bottom housing assembly.
      11) One #1100CHA bottom housing assembly.
      12) One #8DIV 8" Divider.
   f. Die cast aluminum, round activation cover.
      1) Surface mount flange to accommodate carpet floor finish.
      2) Finish as selected by the Architect.
         a) Powder coat finish: Black, Bronze, Gray, Brass, Nickel.
         b) Metallic finish: Brushed Aluminum.

g. Manufacturer: Wiremold #8AT series.

I. Type J

1. Box
   a. Listed and evaluated by an NRTL to meet the applicable U.S. safety standards for scrub water exclusion when used on tile, terrazzo, wood, and carpet covered floors.
   b. Classified for use in 1, 1 1/2, and 2 hour fire rated floor systems.
   c. 4" round with two compartments.
   d. Construction:
      1) Stamped steel with integral intumescent firestop material.
      2) Insertion tabs to hold body in place without additional fasteners.
      3) Enamel finished interior.
   e. Device Plates and Accessories:
      1) One #4REC one 20 amp duplex prewired receptacle.
      2) One #42A keystone communications device mounting plate.
      3) One #4DIV wiring compartment divider.
   f. Die cast aluminum, round activation cover.
      1) Surface mount flange to accommodate carpet floor finish.
      2) Finish as selected by the Architect.
         a) Powder coat finish: Black, Bronze, Gray, Brass, Nickel.
         b) Metallic finish: Brushed Aluminum.
   g. Manufacturer: Wiremold #4AT series.

2.2 DEVICE QUANTITIES

A. Type A: Two duplex receptacles, one voice and one data jack, and one decora bracket for HDMI device as shown on drawing Detail 1/E109.

B. Type B: One duplex receptacle.

C. Type C: Two duplex receptacles, two data jacks, and three Extron XLR jacks.

D. Type D: Two duplex receptacles, one voice and one data jack, and one decora bracket for HDMI device as shown on drawing Details 2/E109 and 4/E109.

E. Type E: Two duplex receptacles, one voice and one data jack, and one decora bracket for HDMI device as shown on drawing Detail 1/E110.

F. Type F: Two duplex receptacles, one voice and two data jacks, one Multimedia Station Input (XID) as shown on drawing Detail 4/E111. Also see Specification 275111 for additional details.

G. Type G: Two duplex receptacles, one Multimedia Station Input (XIX), and two 3-pin XLR jacks (M2). Also see Specification 275117 for additional details.

H. Type H: Two duplex receptacles, one 3-pin XLR jack, one Multimedia Station Input (XIX), and one Multimedia Station Output (XOX). Also see Specification 275117 for additional details.

I. Type J: One duplex receptacle and one data jack.

2.3 WIRING DEVICES

A. Power: Receptacles as per Section 262726.

B. Voice/data: Jacks as per Section 271500.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Verify concrete depth prior to ordering floor boxes.

B. Verify exact location of each floor box with Architect prior to installation.

C. Install box opening flush with floor in accordance with Code, product listing and manufacturer's recommendations.

D. Activation Cover Installation

1. Carpet/VCT floor finishes: Install cover after floor covering installation is completed.
2. Tile floor finishes: Install cover prior to tile/grout installation. Shim cover as required so top of cover is flush with floor.

E. Install floor boxes with square covers parallel or perpendicular to building lines.

END OF SECTION

SECTION 260553 - IDENTIFICATION

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Label electrical equipment as required by Codes and Specifications and as specifically directed by Engineer.

PART 2 – PRODUCTS

2.1 PANEL DIRECTORIES

A. Include directory cards with panelboards.

2.2 NAMEPLATES

A. Machine engraved black laminate with white core, except as otherwise indicated.

B. Minimum letter size: 1/8".

C. Minimum plate size: 1" X 3".

2.3 VOLTAGE MARKERS

A. Vinyl impregnated cloth markers with legend as required.

B. Manufacturer: Ideal #44-360, or equivalent.

2.4 PRESSURE SENSITIVE TAPE

A. Use only when specifically referred to in other Sections.

B. Manufacturer: Dymo, or equivalent.

2.5 UNGROUNDED CONDUCTOR IDENTIFICATION

A. As per NEC 210.5(C) and 215.12(C).

B. Typewritten cards behind plastic shield, affixed with double-stick carpet tape. Heat surface prior to affixing directory.

PART 3 – EXECUTION

3.1 GENERAL

A. Directory Cards

1. **Typewritten only.** Hand lettering unacceptable, except at "spares" and "spaces", where neat hand lettering with erasable pencil is required.
2. Indicate type of load and rooms where load occurs.
3. **Do not use room numbers as shown on Drawings, but refer to name and numbers on door.**
4. Do not identify until final load balancing is accomplished.

B. Nameplates

1. Apply plumb and level with two counter-sunk screws.
2. Glue, double-stick tape, or similar adhesive not acceptable.

C. Device Plates

1. Machine engrave directly on plate in lieu of separate nameplate.
2. Fill inscriptions with contrasting color.

D. Voltage Markers

1. Not visible in finished areas.

E. Junction Boxes

1. Mark all covers with indelible marker to indicate panelboard designation and circuit numbers for circuits contained within box.

3.2 EMERGENCY SYSTEM COMPONENTS

A. All boxes and enclosures (including transfer switches, generators and power panels) for emergency circuits shall be permanently marked so they will be identified as a component of an emergency circuit for system.

3.3 SERVICE EQUIPMENT FAULT CURRENT NAMEPLATE

A. Provide warning nameplate on each service disconnecting means enclosure indicating the fault current of the system.

B. Fault current shall be calculated at the utility transformer, using an assumed infinite primary bus, and using the actual transformer impedance and kVa values.

C. Red laminate with white core.

D. Letter height: minimum ¼”

E. Legend

SERVICE AVAILABLE FAULT CURRENT: _____
TRANSFORMER KVA: _____
TRANSFORMER IMPEDANCE: _____
DATE: _____

END OF SECTION

SECTION 260573 – COORDINATION STUDY

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide a complete fault current analysis and protective device coordination study in accordance with IEEE 242 for the entire distribution system utilizing computer based modeling. If the project interfaces with existing electrical equipment, utilize the first existing upstream overcurrent device outside the project scope as a fixed reference point.

2. Provide a complete arc flash analysis in accordance with IEEE 1584 requirements. Install specific Arc Flash Protection Boundary and Personal Protective Equipment level label on all electrical equipment within the project scope in accordance with NFPA 70E.

1.2 QUALIFICATIONS

A. The analysis and report shall be performed by a professional engineer licensed in the state where the Project is located. The engineer shall be regularly engaged in the practice of short circuit, device coordination, and arc flash studies utilizing computer programs.

1.3 SUBMITTALS

A. Shop Drawings:

1. Preliminary Fault Current and Coordination reports shall be submitted and approved as a prerequisite to approval of associated electrical distribution equipment shop drawings. The system model shall include:
   a. Utility Transformer and Metering Equipment
   b. Power Distribution Equipment
   c. Motor Control Centers
   d. Branch Panelboards
   e. Transformers
   f. Generators and Transfer Equipment
   g. UPS systems
   h. Elevators
   i. HVAC Equipment 1HP and larger
   j. Refrigeration Equipment
   k. Industrial Control Panels

2. Submit information in accordance with Section 260500. Show all details of:
   a. General report information including labeling convention and computer program utilized.
   b. Single-line diagram.
   c. Equipment input data.
   d. System impedance diagram utilizing estimated feeder lengths based on anticipated conduit routing.
   e. Fault current and equipment duty evaluation reports.
   f. Preliminary device setting reports including time current curves.
   g. Evaluation results and recommendations if any.

h. Sample Arc Flash Label.

3. Final Fault Current and Coordination reports shall be submitted after all final conductor lengths are known. Any settings adjusted based on any changes during construction shall be indicated on final report. Any changes to the drawings during construction that impact the fault current and coordination report shall also be included in the final report.

B. Record Manuals

1. Submit information in accordance with Section 260500.
2. Include final fault current and coordination report, with all corrections and changes included.
3. Include Arc Flash Hazard Report.

PART 2 – PRODUCTS

2.1 COMPUTER SOFTWARE DEVELOPERS

A. The computer program utilized for the analysis shall be nationally distributed and in wide use. Software algorithms shall comply with requirements of standards referenced in this specification and reports shall comply with IEEE 399.

B. Acceptable Manufacturers.

1. CGI CYME
2. EDSA Micro Corporation.
3. ESA Inc.
4. Operation Technology Inc.
5. SKM Systems Analysis, Inc.

PART 3 – EXECUTION

3.1 POWER SYSTEM DATA

A. Single-line diagram.

1. Include the product specific data for all components considered in the study. Equipment labeling tags shall be consistent with the electrical distribution system diagrams shown on the Drawings.
2. Equipment types, model, and ratings shall be displayed. Transformers and generators shall include kVA, impedance data, and voltage information. Motors shall include horsepower. Feeders shall display conductor size and length.

B. Impedance diagram shall indicate resistance and reactance of feeders.

3.2 FAULT CURRENT STUDY

A. Maximum Momentary (1/2 cycle) and Interrupt (5 cycle) rms symmetrical fault currents shall be calculated for both three-phase bolted fault and phase to ground fault conditions. Separate calculations shall be performed for normal power sources and alternate power sources if they exist.

B. Utilize single-line diagrams to display fault currents for different conditions and scenarios.

C. Equipment Duty Report shall verify interrupt ratings of overcurrent protective devices comply with associated ANSI/IEEE standards.

1. The tabulation type report shall indicate the overall maximum available fault current at each device and the device's short-circuit withstand rating.
2. The report shall highlight any devices with areas of concern and/or inadequacies. These issues shall be promptly brought to the Engineer's attention.

3.3 COORDINATION STUDY

A. The protective device study shall be developed to provide selective coordination of overcurrent protection devices in areas of the distribution system required by the NEC. All other areas of the distribution system shall be coordinated to the greatest extent possible so as to minimize (localize) outages during fault clearing.

1. If any aspects of the system coordination are found to be unacceptable by either the Coordination Study Engineer or the Project Engineer, the Equipment supplier shall be responsible for costs associated with any required circuit breaker frame or trip module changes.

B. Device settings shall fully protect feeders and equipment in accordance with associated IEEE standards. Settings shall not result in nuisance tripping of devices due to inrush or magnetization of equipment.

C. In order to minimize arc flash hazard, pick up and time delay settings of each device shall be set as low as possible without compromising system coordination, damage protection, and nuisance tripping.

D. Log type time/current curves shall be submitted that graphically illustrate the coordination of devices installed in series of a circuit. Provide separate sets of curves for alternate power source scenarios. Each Coordination Curve shall show the following information:

1. Device labels
2. Time/current curves of each overcurrent protection device, cut off at maximum fault-current point.
   a. Sensor settings shall be displayed with the device label.
3. Transformer damage curves and inrush points.
4. Feeder damage curves.
5. Motor starting curves.

E. A tabulation type summary of selected settings for all overcurrent protection devices shall be included in the submittal.

F. Where selectivity cannot be achieved, promptly notify the Engineer of the cause and any recommendations available.

3.4 ARC FLASH STUDY

A. Upon approval of all overcurrent protection device settings, provide arc flash calculations in accordance with IEEE 1584 to determine the Arc Flash Boundary and Personal Protective Equipment (PPE) level for all electrical distribution equipment included in the project scope.

B. The calculations for each piece of equipment shall be based on the upstream trip device. Do not incorporate the fault clearing properties of any “Main Overcurrent Device” that is integral with the equipment.

C. Provide a tabulation type report that includes estimated arc fault ampacity and time, incident energy, flash boundary, and required PPE.

3.5 INSTALLATION

A. Test, calibrate, and adjust the overcurrent protective devices as recommended in the Coordination Study.

B. Install ANSI type Arc Flash Labels that include Boundary and PPE information on all associated electrical equipment.

END OF SECTION

SECTION 262200 - TRANSFORMERS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide power transformers for voltage transformation where shown on Drawings.

1.2 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500.
2. Include:
   a. Primary and secondary voltage.
   b. KVA rating.
   c. Impedance.
   d. Wiring diagram.
   e. Quantity and percentage taps.
   f. Dimensions.
   g. Weight.
   h. Any other pertinent information.

B. Record Manuals

1. Submit information in accordance with Section 260500.
2. Include:
   a. Shop Drawing submittal.
   b. Installation and maintenance instructions furnished with transformer by manufacturer.
   c. Provide available secondary terminal fault current calculation based on actual transformer impedance. In lieu of infinite primary buss, utilize actual available primary fault current in the calculation.

1.3 QUALITY ASSURANCE

A. Codes and Standards

1. Construct and rate all transformers in accordance with UL Standard 506, National Electrical Codes, American National Standard Institute Specification C57.12 and National Electrical Manufacturers Association Specification ST-20.
2. Transformer losses and efficiencies shall be in compliance with the U.S. Department of Energy's requirements.

PART 2 – PRODUCTS

2.1 TRANSFORMERS

A. Rating

1. Dry type, three phase 480 Delta primary and 120/208 Wye secondary.
2. KVA rating: Scheduled on Drawings.

B. Cores

1. High grade, non-aging silicon steel.
2. Maximum magnetic flux densities substantially below saturation level.
3. Core laminations clamped and compressed to provide quite operation.
4. Core and coil assembly bolted to enclosure base, but isolated by means of rubber, vibration-absorbing mounts.
5. No metal-to-metal contact between core and coil assembly and enclosures.
6. Sound isolating systems requiring complete removal of all fastening devices not acceptable.
7. Core electrically grounded to enclosure by means of flexible copper grounding strap.

C. Sound Levels

1. Quiet type with design level which operates at/or below published NEMA standards.

KVA	NEMA Standard Sound Level
0-9	40
10-50	45
51-150	50
151-300	55
301-500	60

D. Coils

1. Aluminum conductors.
2. Continuous wire wound construction.
3. Impregnated with thermo-setting varnish.
4. Final wrap of electrical insulating material to prevent mechanical injury to coil.

E. Primary taps

1. Ratings less than 15 KVA: Two 5% FCBN taps.
2. Ratings 15 KVA and larger: Two 2-1/2% FCAN and four 2-1/2% FCBN taps.

F. Insulation Systems

1. Class 220°C insulation, 115°C temperature rise.
2. 115°C temperature rise not to be obtained by use of forced air cooling or by over-ventilating coil.

G. Enclosures

1. Sheet metal, degreased, phosphatized and finished with baked outdoor enamel.
2. VENT GUARD/RODENT GUARD REQUIRED ON ALL EXTERIOR LOCATIONS.

H. Wiring Compartments

1. Adequately sized for compliance with NEC.
2. Listed for 75° C wire.
3. Locate at bottom of transformer.
4. Rigidly mounted terminals to accommodate wiring lugs.
5. Enclosure temperature rise not to exceed 35°C rise above a 40°C ambient.
6. Rating 10 KVA and less: Non-ventilating enclosure.
7. Rated above 10 KVA: Ventilated enclosure with openings designed to prevent accidental access to energized parts.
8. Weatherproofed for exterior locations.

I. Manufacturer

1. All transformers shall be supplied by the same manufacturer.

2. Manufacturer's nameplate to include:
   a. Manufacturer's name.
   b. Primary and secondary voltages.
   c. KVA rating.
   d. Serial number.
   e. Catalog number.
   f. Impedance.
   g. Wiring diagram.
   h. Degrees temperature rise.
   i. NRTL listing.
3. Sizing and design based upon Acme equipment; Acme catalog numbers utilized for reference.
4. Other acceptable manufacturers: Approved equal units by Hevi-Duty, Jefferson, or panelboard manufacturer.
5. Contractor is cautioned to verify all physical dimensions of "equal" units prior to accepting quotation for bid.

PART 3 – EXECUTION

3.1 STORAGE

A. Store transformer in a cool, dry space prior to installation.

3.2 INSTALLATION

A. General

1. Stub feeder conduit directly into wiring compartment.
2. Where conduit stubs are impractical, or for suspended installations, connect to feeder by means of flexible metal conduit. Use liquidtight flexible metal conduit in damp areas.
3. Support suspended transformers from structural members of sufficient capacity with rods and trapeze hangers.
4. Examine area to receive transformers to ensure adequate clearance for installation.
5. Provide fused disconnect switch adjacent to transformer when required by NEC Article 240.21(C)(5).

B. Grounding

1. Ground transformer in accordance with NEC Article 250. Refer to NEC 250.30 for grounding separately derived systems.

C. Identification

1. Provide nameplate identification in accordance with Section 260553 for all transformers.
2. Example:

Transformer T2
480-120/208 Volts, 75 KVA
Fed From Panel HP2

D. Concrete Pads

1. Locate floor mounted transformer on concrete pad.
2. Dimensions: 4" high and extend minimum 4" from all sides of transformer.
3. Provided by Division 26. Coordinate installation.

3.3 TESTS

A. Check output voltage and select correct tap to achieve the rated nominal voltage.

END OF SECTION

SECTION 262210 – DRY TYPE PACKAGE POWER SUPPLIES

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Furnish and install dry type package power supplies where indicated on the Drawings.

B. Description of System

1. Dry type package power supply used to provide limited 120 and 208 or 240 volt lighting power circuitry from 480 volt systems. Transformer, primary and secondary overcurrent protection, and panel bus furnished as a complete package.

1.2 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500.

B. Record Manuals

1. Submit information in accordance with Section 260500.
   a. Include fault current available at primary terminals. Fault current calculations shall be based on actual installation criteria (conductor lengths, raceway types, etc.

PART 2 – PRODUCTS

2.1 DRY TYPE PACKAGE POWER SUPPLIES

A. Transformer

1. 480 volt primary.
2. 240/120 one phase or 208/120 three phase secondary, scheduled on the Drawings.
3. Minimum 2-5% FCBN primary taps.
4. 115° C temperature rise above 40° C maximum ambient.
5. 185 degrees NRTL component recognized insulation system.
6. Encapsulated sand-epoxy.

B. Primary and secondary circuit breakers as scheduled on the Drawings.

C. Branch Circuit Breaker

1. As scheduled on the Drawings.
2. Plug on.
3. Quick-make, quick-break thermal magnetic.
4. Trip indicating.
5. Common trip on multipole breaker; handle ties not acceptable.

6. Single pole 15 and 20 ampere ratings to be NRTL listed as "Switching Breakers" at 120 V AC, and carry SWD marking.

D. Bus Assembly

1. Plated current carrying parts.
2. "Distributed Phase" or "Phase Sequence" type bus bar connections.
3. Adjacent single pole breakers connected to opposite polarities.
4. Multi-pole breakers installable in any position.

E. Enclosures

1. Suitable for both indoor and outdoor use.
2. Horizontal or vertical mounting.
3. Hinged access door to maintain itself in the open position when desired (vertical position).
4. Padlock provisions.

F. All sizes to be NRTL tested suitable for use as service equipment.

G. Manufacturer: Acme Panel Tran, or approved equal by panelboard manufacturer.

2.2 PLYWOOD BACKING FOR SURFACE MOUNTED DRY TYPE PACKAGE POWER SUPPLIES

A. 3/4 " grade AD, fire-resistant, painted gray (including edges).

PART 3 – EXECUTION

3.1 STORAGE

A. Store dry type package power supplies in a cool, dry area prior to installation.

3.2 INSTALLATION

A. General

1. Install where shown on Drawings, plumb and level.
2. Top of trim 6'-3" above finished floor.
3. Adjust operating mechanism for free mechanical movement.
4. Provide 3/4" plywood backing for all surface mounted equipment.
5. Tighten all lugs in accordance with manufacturer's recommendations.

B. Grounding

1. Ground dry type package power supply in accordance with NEC 250. Refer to NEC 250.30 for grounding separately derived systems.

C. Identification

1. Identify dry type package power supply and directories in accordance with Section 260553.

2. Provide nameplate similar to following example:

PANEL MPZ-2
120/240 Volt 1∅ 3W
1" C - 2#10

3.3 TESTS

A. Check output voltage and select correct tap to achieve rated nominal voltage.

B. Balancing Load

1. Circuiting shown on Drawings is designed to produce equal loading on all phases.
2. Under actual operation, check and make circuit adjustments as required to produce a balanced condition.

3.4 CLEANING

A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.

B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 262416 - PANELBOARDS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide panelboards where indicated and scheduled.

1.2 SUBMITTALS

A. Shop Drawings:

1. Submit information in accordance with Section 260500. Show all details of:
   a. Lugs.
   b. Locations for grounding bar, neutral bar and directory.
   c. Main bus amperage and arrangement.
   d. Weight and physical dimensions of enclosures.
   e. Cover and lock type.
   f. Quantity of spaces.
   g. Quantity, arrangement, amperage and short circuit withstand ratings in RMS amperes for all circuit breakers.
   h. Any other pertinent data.
   i. Applicable series rating for this particular riser/fault current combination.

B. Record Manuals

1. Submit information in accordance with Section 260500.
   a. Include fault current available at buss. Fault current calculations shall be based on actual installation criteria (conductor lengths, raceway types, etc.)
2. Include installation and maintenance instructions accompanying equipment.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Product of same manufacturer.

B. Sizing and design based upon Eaton equipment; Eaton catalog numbers utilized for reference.

C. Other Acceptable Manufacturers.

1. Approved equal units by Siemens or Square D.

D. Contractor is cautioned to verify all physical dimensions of "equal" units prior to accepting quotation for bid.

2.2 GENERAL

A. Provide sub-feed lugs, contactors, main breakers or other equipment as scheduled.

B. Provide copper bus, copper isolated neutral bar and copper grounding bar in all panelboards.

C. Use load centers only where specifically indicated. Provide copper bus with plated aluminum neutral and grounding bar.

D. NRTL-listed, and "suitable for use as service equipment" when required.

E. Feeder risers are schematic only and not intended to infer lug arrangements. Contractor to indicate desired lug arrangements and sizes on shop drawings.

F. Connection from load side of main breaker to panel bus shall be bus bar. Insulated wire and backfed types not acceptable.

G. NRTL-recognized series ratings acceptable, with minimum ratings as specified herein.

2.3 BRANCH CIRCUIT PANELBOARDS

A. Circuit Breakers

1. Bolt-on.
2. Breaker Types:
    a. Under 400 ampere: Quick-make, quick-break, thermal magnetic unless otherwise indicated.
    b. 400 ampere and over: Solid-state molded case circuit breakers:
        1) Breakers shall contain electronic sensing, timing and tripping circuits.
            a) Long time current
                (i) Adjustable current pickup
                (ii) Adjustable time delay
            b) Short time current
                (i) Adjustable current pickup
                (ii) Adjustable time delay
            c) Instantaneous current
                (i) Adjustable current pickup
            d) Ground fault, where required, with integral test and reset buttons.
                (i) Adjustable current pickup
                (ii) Adjustable time delay
        2) Main disconnect devices shall include maintenance-mode override.
3. Trip indicating.
4. Common trip on multi-pole breakers; handle ties not acceptable.
5. Minimum SCCR rating:
    a. NRTL tested and certified series combinations acceptable.
        1) 10,000 for systems up to 240 volts.
        2) 35,000 for 277/480 volt systems.
6. Single pole 15 and 20 ampere ratings to be NRTL-listed as “Switching Breakers” and carry SWD marking.

7. FIRE ALARM EQUIPMENT
    a. Circuit breakers feeding fire alarm control panels and/or other fire alarm equipment shall be equipped with a pad-locking device capable of locking the circuit breaker in the closed position.

B. Bus Assembly and Temperature Rise

1. Rating: As scheduled.
2. 98 percent conductivity.
3. "Distributed phase" or "Phase sequence" type bus bar connections.
4. Adjacent single pole breakers connected to opposite polarities.
5. Multi-pole breakers installable in any location.
6. Provisions for additional breakers such that field addition of connectors or mounting hardware will not be required.

C. Wiring Terminals

1. NRTL-listed as suitable for type of conductor specified.

D. Circuit Numbering

1. Starting at top, odd numbers in sequence down lefthand side and even numbers in sequence down righthand side.

E. Cabinet

1. Enclose bus assembly in steel cabinet.
2. Wiring gutter sizes and steel gauge in accordance with NEMA and NRTL standards.
3. Fabricate box from galvanized steel or equivalent rust resistant steel.
4. Furnish **without** pre-punched knockouts.

F. Fronts

1. Code gauge, full finished steel with rust inhibiting primer and baked enamel finish.
2. Not removable with door in locked position.
3. Adjustable trim clamps.
4. Concealed steel hinges.
5. Door with tumbler-type cylinder lock, catch and spring-loaded door pull.
6. Flush lock not to protrude beyond door front.
7. Key all locks alike.
8. Circuit directory frame and card with clear plastic covering on inside of door.

G. Manufacturer

1. Eaton Pow-R-Line series.

2.4 POWER DISTRIBUTION PANELBOARDS

A. Circuit Breakers

1. Bolt-on.
2. Breaker Types:
    a. Under 400 ampere: Quick-make, quick-break, thermal magnetic.

b. 400 ampere and over: Solid-state molded case circuit breakers:
1) Breakers shall contain electronic sensing, timing and tripping circuits.
a) Long time current
(i) Adjustable current pickup
(ii) Adjustable time delay
b) Short time current
(i) Adjustable current pickup
(ii) Adjustable time delay
c) Instantaneous current
(i) Adjustable current pickup
d) Ground fault, where required, with integral test and reset buttons.
(i) Adjustable current pickup
(ii) Adjustable time delay
2) Main disconnect devices shall include maintenance-mode override.
3. Trip indicating.
4. Common trip on multi-pole breakers; handle ties not acceptable.
5. Equipped with individually insulated braces and protected connectors.
6. Front faces of all circuit breakers to be flush with each other.
7. Affix large, permanent, individual circuit numbers to each breaker in uniform position.
8. Minimum 35,000 SCCR rated.
a. NRTL tested and certified series combinations acceptable.

B. Bus Assembly and Temperature Rise

1. Rating: As scheduled.
2. Insulated bus structure.
3. 98 percent conductivity.
4. "Distributed phase" or "phase sequence" type bus bar connections.
5. Adjacent single pole breakers connected to opposite polarities.

C. Wiring terminals

1. NRTL-listed as suitable for type of conductor specified.

D. Cabinet

1. Enclose bus assembly in steel cabinet.
2. Wiring gutter sizes and steel gauge in accordance with NEMA and NRTL standards.
3. Fabricate box from galvanized steel or equivalent rust resistant steel.
4. Furnish **without** pre-punched knock-outs.

E. Fronts

1. Minimum 12-gauge, full finished steel with rust inhibiting primer and baked enamel finish.
2. Circuit directory frame and card with clear plastic covering.

F. Safety Barriers

1. As required by UL or other NRTL.

G. Manufacturer

1. Eaton Pow-R-Line series.

2.5 CABLE TIES

A. Thomas and Betts Company "Ty-Rap" or equivalent.

2.6 PLYWOOD BACKING FOR SURFACE MOUNTED PANELBOARDS.

A. 3/4" grade AD, fire-resistant, painted gray (including edges).

PART 3 – EXECUTION

3.1 STORAGE

A. Store panelboards in a cool, dry area prior to installation.

3.2 INSTALLATION

A. General

1. Install where shown on Drawings, plumb and level.
2. Top of trim 6'-3" above finished floor for wall-mounted panelboard.
3. Adjust operating mechanism for free mechanical movement.
4. Conductors neatly dressed and banded with nylon cable ties after final load balancing.
5. From each flush installation, stub three additional 3/4" conduits into nearest accessible ceiling space to provide for future utilization of spare circuits.
6. Provide 3/4" plywood backing for all surface-mounted panelboards.
7. Tighten all lugs in accordance with manufacturer's recommendations.
8. For all fusible distribution panelboards, arrange devices in descending order such that bussed space is at top and largest devices are at bottom.
9. Provide individual terminal or lug for each wire. Multiple wires to common terminal, or several terminals for single stranded conductor not acceptable.

B. Identification

1. Identify panelboards and directories in accordance with Section 260553.
2. Provide nameplate similar to following example:

PANEL L6
120/208 VOLT 3∅ 4W
2" C – 4 #3/0
FED FROM SWBD #1

3. When required, provide identification as per NEC 210.5(C) at each branch circuit panelboard.

C. Concrete Pad

1. Locate floor mounted panelboard on concrete pad.
2. Dimensions: 4" high and extend 4" from front and sides.
3. Provided by Division 26. Coordinate installation.

3.3 TESTS

A. Balancing Load

1. Circuiting shown on Drawings is designed to produce equal loading on all phases.
2. Under actual operating, check and make circuit adjustments as required to produce balanced condition.

B. GFPE Testing

1. Performed when first installed on site, prior to being energized by utility transformer.
2. Primary current injection method shall be used for testing purposes per NEC 230.95-C.
3. Conducted in accordance with manufacturer's instructions.
4. Conducted in presence of manufacturer's representative.
5. Provide letter of verification to Engineer indicating:
   a. Date of test.
   b. Name of manufacturer's representative present.

3.4 CLEANING

A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.

B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 262726 – WIRING DEVICES AND DEVICE PLATES

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide wiring devices complete with device plates of matching or specified color. Wiring devices include receptacles for the connection of portable equipment and switches used for the control of both lighting and fractional horsepower motor loads. Also included are dimmers, occupancy sensors, photoelectric switches and time switches.

B. Work Installed But Furnished by Others

1. Where indicated, install devices furnished by other Divisions of this Specification.

1.2 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500.

B. Record Manuals

1. Provide information in accordance with Section 260500.
2. Include installation and maintenance instructions accompanying the equipment.

PART 2 – PRODUCTS

2.1 GENERAL

A. Device color: Gray or as selected by Architect. Verify with Architect. (Exception: Red devices on emergency circuits where applicable).

B. All devices shall be of the same manufacturer, except where specifically noted otherwise with the phrase "NO SUBSTITUTION".

2.2 SWITCHES

A. AC Toggle and Keyed Switches

1. 20-ampere 120/277 volt AC and HP rated.
2. Industrial Grade.
3. Color coded face or body by amperage.
4. Screw pressure plate back wire and side wire.
5. Federal Spec WS-896 listed.
6. Acceptable Manufacturers:
   a. Cooper 2220 series
   b. Hubbell 1220 series
   c. Leviton 1220 series

d. Pass & Seymour PS20AC series

B. Pilot Light Switches

1. Neon lamp in red toggle handle, lit in "on" position.
2. 20 ampere, 120/277 volt AC rated.
3. Manufacturer: As listed above.

C. Remote Photoelectric Switches

1. Threaded swivel mounting with locking nut and neoprene gasket.
2. Light level adjustment slide.
3. Activation: 1-5 footcandle on, 3-15 footcandle off.
4. Manufacturer: Intermatic #K4200 series, wattage and voltage as required.
5. Other acceptable manufacturers: Paragon, Area Lighting Research, Precision, or Tork.

D. Occupancy Sensors

1. Ceiling Mount – Line Voltage
   a. Self-contained line voltage unit with no external relays or power packs required.
   b. Passive dual technology sensing combining passive infrared and ultrasonic/microphonic technology. Selective for initial and maintained triggering.
   c. Rating: 120 VAC @ 800 watts, 277 VAC @ 1200 watts, electronic ballast rating. No minimum load requirements.
   d. Ceiling-mount with 360° conical pattern coverage.
   e. Adjustable time delay, from 5 to 20 minutes.
   f. Automatic adjustment option for continuous time of day usage monitoring with automatic off delay adjustment.
   g. Integral light level sensor to prevent turning lights on at selected light level between 10 and 300 footcandles.
   h. LED activity Indicator.
   i. Manufacturer: WattStopper #DT-355, Sensorswitch CMR-PDT series, Leviton ODC series, Hubbell OMNIDT-BP series, or approved equal.
2. Ceiling Mount – Low Voltage
   a. Sensor:
      1) Self-contained low voltage unit obtaining 24 VDC power from external power pack.
      2) Passive dual technology sensing combining passive infrared and ultrasonic/microphonic technology. Selective for initial and maintained triggering.
      3) Ceiling-mount with 360° conical pattern coverage.
      4) Adjustable time delay, from 5 to 20 minutes.
      5) Automatic adjustment option for continuous time of day usage monitoring with automatic off delay adjustment.
      6) Integral light level sensor to prevent turning lights on at selected light level between 10 and 300 footcandles.
      7) LED activity Indicator.
      8) Manufacturer: WattStopper #DT-300, Sensorswitch CM-PDT Series, Leviton OSC series, Hubbell OMNIDT series, or approved equal.
   b. Power Pack:
      1) Transforms an input voltage of 120, 240 or 277 VAC to Class 2 24 VDC to power remote sensors.
      2) Integral 20 amp line voltage relay with relay protection. Where circuit loads exceed 1920 watts @ 120 VAC or 4432 watts @ 277 VAC, provide two-pole power pack or additional single pole power packs as required.

3) Provide quantities as required.
4) Manufacturer: WattStopper #BZ series, Sensorswitch PP20 series, Leviton OPP20 series, Hubbell UVPP series, or approved equal.

3. Wall Mount
   a. Self-contained line voltage unit with passive infrared sensing.
   b. Rating: 120 VAC @ 800 watts, 240/277 VAC @ 1200 watts, electronic ballast rating. No minimum load requirements
   c. PIR collector beams view out horizontally 35 feet in a wall-to-wall pattern, with a 20-foot effectiveness for small hand or body motions.
   d. Adjustable time delay, from 5 to 20 minutes, with "OFF" override switch.
   e. Automatic adjustment option for continuous time of day usage monitoring with automatic off delay adjustment.
   f. Bypass mode to allow override button to act as a standard on-off switch in case of sensor failure.
   g. Vandal resistant lens.
   h. LED activity Indicator.
   i. Multi-way version:
      1) Simultaneous load control from up to four device locations.
   j. Dual-level version (ab switching):
      1) Two separate relays with dual override switches.
      2) Independent Auto or Manual mode per relay.
   k. Manufacturer: WattStopper PW series, Sensorswitch WSX series, Leviton OSSMT series, Hubbell LHIR series, or approved equal.
4. Wall Mount with 0-10V Dimming
   a. Self-contained line voltage unit with passive infrared sensing.
   b. Rating: 120 VAC @ 800 watts, 240/277 VAC @ 1200 watts. No minimum load requirements.
   c. Class 1 control of 0-10 Volt LED dimming for full range dimming control.
   d. PIR collector beams view out horizontally 35 feet in a wall-to-wall pattern, with a 20-foot effectiveness for small hand or body motions.
   e. Adjustable time delay, up to 30 minutes, with "OFF" override switch.
   f. Multi-location capable.
   g. Manufacturer: WattStopper PW-311, Sensorswitch WSX-D, Hubbell LHD-IRS series, or approved equal.

2.3 RECEPTACLES

A. General Purpose

1. 20 ampere, self-grounding, NEMA 5-20R, industrial specification grade.
2. Nylon face with finder grooves and compact body.
3. Minimum 0.032" triple wipe brass contacts.
4. Corrosion resistant steel strap interlocked with face and body.
5. Screw pressure plate back wire and side wire.
6. Federal Spec WC-596 listed.
7. Acceptable Manufacturers:

a.	Cooper	5362
b.	Hubbell	5362
c.	Leviton	5362
d.	Pass & Seymour	CRB5362

B. Tamper Resistant

1. 20 ampere, self-grounding, NEMA 5-20R.

2. Energized only when two blade or three blade grounding cord cap is properly inserted.
3. Use in all locations indicated in Part 406.12 of the National Electric Code.
4. Acceptable Manufacturers:
   a. Cooper TRBR20
   b. Hubbell CR20TR
   c. Leviton CR20TR
   d. Pass & Seymour TR20

C. GFCI

1. 20 ampere, feed-through type.
2. Two utilization points per device, with vertical orientation.
3. Use Tamper Resistant version in all locations indicated in Part 406.12 of the National Electric Code
4. Manufacturer: As listed above.

D. Surge Suppression Receptacle

1. 20 ampere.
2. Power-on indicator light.
3. Damage alert: Audible or visual annunciation to indicate surge protection no longer functional.
4. Three-mode protection: Line-to-neutral, line-to-ground, and neutral-to-ground.
5. Manufacturer: As listed above.

E. Damp & Wet Locations

1. All 15 and 20 ampere, 125 and 250 volt non-locking receptacles shall be listed weather-resistant type as per NEC 406.9(A) and 406.9(B)(1).
2. Manufacturer: As listed above.

2.4 DIMMERS

A. LED

1. Control of 0-10 Volt LED dimming for full range dimming control.
2. Wattage as required by luminaire count in room.
3. Integral power pack for positive off.
4. Provide separate power pack if required by total room wattage.
5. Manufacturer: Lutron Diva Series #DVSTV.

2.5 DEVICE PLATES

A. Flush Interior

1. Opening for device intended.
2. 430 or 302/304 stainless steel, or as selected by Architect.
3. Where plastic plates are selected by Architect, provide thermoplastic type.
4. Manufacturer: Cooper, Hubbell, Leviton and Pass & Seymour.

B. Surface Interior

1. 1/2" raised cover

C. Damp & Wet Locations

1. Damp locations:
   a. Refer to NEC 406.9(A).
   b. Die-cast aluminum construction with stainless steel springs.
   c. Unless indicated otherwise on the Drawings, Manufacturer: Pass & Seymour #4500 series or equivalent.
2. Wet locations:
   a. Refer to NEC 406.9(B).
   b. Unless indicated otherwise on the Drawings, Manufacturer: Red Dot #CKMU (horizontal) or #CKMUV (vertical), or approved equal by Hubbell.

PART 3 – EXECUTION

3.1 INSTALLATION

A. General

1. Install device and plates where shown on Drawings in accordance with Code, product listing and manufacturer's recommendations.
2. Refer to Section 260534-3.1C for mounting heights.
3. Plumb and level.
4. Tight to wall.
5. Thoroughly cover wall opening around device.
6. Replace all devices and plates that become discolored or burned during construction.
7. Provide blank plates for unused openings.
8. Connect wiring devices by means of single conductor tails. Multiple wire connections not acceptable.
9. Tighten unused connection screws.

B. Identification

1. Identify wall switches which control lighting or equipment not in sight.
2. Refer to Section 260553-3.1C.

C. Receptacles

1. Vertical mounting with grounding pole at bottom.
2. Provide GFCI receptacles at NEC 210.8 locations.

D. Dimmers

1. No common neutrals.
2. Individually mounted: No gang mounting.
3. Do not remove any fins.

E. Photoelectric Switches

1. Install on roof, in center of structure where viewing from ground is minimal.
2. Verify exact location with Architect.
3. Penetrate roof with 3/4" RGSC, securely fastened to structure.
4. Provide flashing to maintain roof integrity.
5. Mount 18" above finished roof surface.

6. Make connections in weatherproof junction box.

F. Occupancy Sensors

1. Provide adequate supports to any structures, ceilings and grid system to safely attach sensors.
2. Mount external power packs (required only for low voltage sensors) within junction box in accessible ceiling space.
3. Verify operating parameters with Engineer.

3.2 TESTS

A. Proper operation of lighting switches, dimmers and occupancy sensors.

B. Duplex Receptacles

1. Proper connections.
2. Test all receptacles with NRTL listed receptacle circuit tester similar to Bryant #5266-PT, or Ideal #EZ Check.

3.3 INSTRUCTIONS

A. Instruct Owner's personnel in proper operation, setting, and maintenance of time switches, dimmers, occupancy sensors, and GFCI receptacles.

END OF SECTION

SECTION 262813 - FUSES

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide all fuses as required.

B. Work Furnished But Not Installed

1. Provide spare fuses for all sizes and classes required.
2. Quantity: 10%, with a minimum of three each rating, including motor starter control transformer fusing.

1.2 SUBMITTALS

A. Record Drawings

1. Indicate actual class, type and size of fuse installed in each device.

B. Record Manuals

1. Submit information in accordance with Section 260500.

PART 2 – PRODUCTS

2.1 FUSES

A. 600 Amperes and Less Protecting Feeders or Combination Motor/Branch Circuit Loads.

1. UL-listed, Class RK-1.
2. Manufacturer: Bussmann LPN-RK/LPS-RK, Littelfuse LLN-RK/LLS-RK, or Brush LEN-R/LES-R.

B. Elevators

1. UL-listed, Class J.
2. Manufacturer: Bussmann LPJ-SP or Littelfuse JTD-ID.

C. Motor Starter Control Transformers

1. As recommended by manufacturer.

D. Plug Fuses

1. Dual element, UL-listed Type S with adapter.
2. Use only as indicated on Drawings for fused toggle switches.

2.2 PLYWOOD BACKING

A. 3/4" grade AD, fire resistant, painted gray (including edges).

PART 3 – EXECUTION

3.1 STORAGE

A. Store fuses in a cool, dry space prior to installation.

3.2 INSTALLATION

A. General

1. Install fuses in accordance with Code, product listing and manufacturer’s recommendations.
2. Verify equipment fuse sized for load prior to installation.
3. All fuses shall be of same manufacturer.
4. Do not mix fuse classes in individual applications.
5. Fuses are not required for switchboard devices marked "Spare".

B. Identification

1. Indicate on inside cover with pressure sensitive tape the size, voltage and type of fuse furnished for each device.

END OF SECTION

SECTION 262816 – ENCLOSED SWITCHES & CIRCUIT BREAKERS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide disconnects where shown on Drawings or required by Code.
2. Provide enclosed circuit breaker where shown on the Drawings.

1.2 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500.
2. Indicate on submittal exact motor or equipment served.
3. Show all details including electrical ratings, enclosure dimensions and other pertinent data.

B. Record Manuals

1. Submit information in accordance with Section 260500.
2. Include installation and maintenance instructions accompanying the equipment.

PART 2 – PRODUCTS

2.1 DISCONNECT SWITCHES

A. Switch Interior

1. Positive “off” position.
2. Lugs: NRTL-listed for aluminum and copper cable.
3. Plated current carrying parts.

B. Switch Mechanism

1. Quick-make, quick-break operating handle and mechanism.
2. Integral part of box.
3. Enclosures: Code gauge sheet steel (NEMA 1) or Code gauge galvanized steel (NEMA 3R).
4. Treat with rust-inhibiting phosphate primer.
5. Finish: Baked enamel.

C. Ratings

1. 250 or 600 volt.
2. Heavy duty.
3. Horsepower rated.
4. NRTL-listed "Suitable for Use as Service Equipment" when required.

D. Fusing

1. NRTL-listed rejection feature.
2. Reject all fuses except UL-listed Class R.

E. Manufacturer: Panelboard manufacturer.

2.2 ENCLOSED CIRCUIT BREAKERS

A. Breaker Types:

1. Under 400 ampere: Quick-make, quick-break, thermal magnetic unless otherwise indicated.
2. 400 ampere and over: Solid-state molded case circuit breakers:
    a. Breakers shall contain electronic sensing, timing and tripping circuits.
        1) Long time current
            a) Adjustable current pickup
            b) Adjustable time delay
        2) Short time current
            a) Adjustable current pickup
            b) Adjustable time delay
        3) Instantaneous current
            a) Adjustable current pickup
        4) Ground fault, where required, with integral test and reset buttons.
            a) Adjustable current pickup
            b) Adjustable time delay
    b. Where used as a main service disconnect, or main branch panel device, provide maintenance-mode override.
3. Trip indicating.
4. Minimum SCCR rating:
    a. 10,000 for systems up to 240 volts.
    b. 35,000 for 277/480 volt systems.

B. Manufacturer: Panelboard manufacturer.

2.3 PLYWOOD BACKING FOR SURFACE MOUNTED SWITCHES

A. For interior locations, mount on 3/4" AD, fire-resistant, painted gray (including edges).

PART 3 – EXECUTION

3.1 STORAGE

A. Store disconnect switches or enclosed circuit breakers in a cool, dry space prior to installation.

3.2 INSTALLATION

A. General

1. Install all required disconnect switches or enclosed circuit breakers in accordance with Code, product listing and manufacturer's recommendations.
2. Plumb and level.
3. Tighten lugs in accordance with manufacturer's recommendations.

B. Identification

1. Identify disconnect switches or enclosed circuit breakers in accordance with Section 260553.
2. Nameplate required for all disconnect switches. Nameplate to include load served, voltage, horsepower or MCA rating, and fuse size. Nameplate to be installed inside of cover on exterior disconnect switches.

   Example:

   RT-1
   480 Volt, 3 Ø
   35 MCA, 40 A Fuses

3. Do not use schedule number, but indicate load served.
4. Pressure sensitive tape identification for disconnect switches containing fuses.
5. Voltage markers on all disconnect switches containing system voltages in excess of 250 volts to ground.

3.3 TESTING

A. GFPE Testing

1. Performed when first installed on site, prior to being energized by utility transformer.
2. Primary current injection method shall be used for testing purposes per NEC 230.95-C.
3. Conducted in accordance with manufacturer's instructions.
4. Conducted in presence of manufacturer's representative.
5. Provide letter of verification to Engineer indicating:
   a. Date of test.
   b. Name of manufacturer's representative present.

3.4 CLEANING

A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.

B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 262822 – ELEVATOR WIRING

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Power service connection.
2. Lighting service connection.
3. Telephone (voice) cabling.

B. Work not included

1. Telephone (located with elevator cab).
2. Control and interlock wiring.
3. Car normal and emergency lighting.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Disconnect Switch for new center elevator only.

1. Main power
   a. Refer to Section 262816.
   b. Fusible, with Form C pilot duty auxiliary contact.
   c. Unless otherwise indicated on manufacturer's literature or Drawings, size 125% full load current.
   d. Class J fuses.
2. Lighting service
   a. Minimum rating 115 volts 20 amperes.
   b. Lockable enclosed circuit breaker, or fusible disconnect as per Specification Section 262816.

B. Disconnect Switch for existing hydraulic elevator only.

1. Main power
   a. Enclosed in single NEMA 1 enclosure.
   b. Fusible switch with shunt trip capabilities.
   c. Amp rating as scheduled on Drawings.
   d. Class J fuses.
   e. Control power transformer with fuses and blocks.
   f. Fire safety interface relay with 120 VAC coil.
   g. Key to test switch.
   h. Green pilot light – “ON”.
   i. Mechanically interlocked auxiliary contact, Form C, 120 VAC-rated, for elevator battery back-up.
   j. Fire alarm voltage monitoring relay (to monitor shunt trip voltage).
   k. Manufacturer: Bussmann Power Module Switch PS series, Mersen ES series, or Littelfuse Power-Switch LPS series.

2. Lighting Service
    a. Minimum rating 115 volts 20 amperes.
    b. Lockable enclosed circuit breaker, or fusible disconnect as per Specification Section 262816.

C. Pit Light

1. Refer to Section 265100.
2. LED strip fixture with lens and wire guard.
3. Minimum of 3,500 delivered lumens.

PART 3 – EXECUTION

3.1 PREPARATION

A. Coordinate entire installation with elevator system installer prior to installation of equipment.

B. Provide available fault current calculations at elevator machine based on actual installation criteria (conductor lengths, raceway types, etc.). Calculations shall incorporate the current limiting effects of fuses supplied with local power module/disconnecting means. Include calculation information in Record Manuals.

3.2 INSTALLATION

A. Power Service

1. Verify exact disconnect location in elevator machine room with elevator system installer.
2. Provide power circuitry to elevator control panel as directed by elevator system installer.

B. Lighting Service

1. Verify exact disconnect location in elevator machine room with elevator system installer.
2. Provide separate 120 volt 20 ampere circuit to elevator control panel as directed by elevator system installer.

C. Elevator Pit

1. Verify pit light location with elevator system installer.
    a. Light location shall provide at least 5 foot-candles on the entire floor area of the pit. Provide multiple pit lights if required.
2. Provide surface GFCI receptacle and toggle switch near pit access ladder.
3. Provide separate 20 ampere circuits for the pit/hoistway lighting and service receptacle.

D. Telephone

1. Provide one Category cable, as specified in Section 271500, in 3/4" conduit from telephone service.
2. Stub into elevator machine room or machine space as directed by elevator system installer.

E. Machine Room or Machine Space (machine room-less application)

1. Lighting as shown on the Drawings.
2. Receptacles shall be GFCI.

3. Provide a dedicated 20 ampere circuit for the machine room/space lighting and a dedicated 120 volt 20 ampere circuit for the machine room/space receptacles.

F. Fire Alarm System Interface

1. General
    a. Fire alarm system interface shall initiate elevator Phase I Emergency Recall Operation in accordance with ASME A17.1 and NFPA 72.
    b. Provide three elevator control outputs from the fire alarm system to the elevator control panel. The designated and alternate lobbies shall be determined by the local inspection authority.
        1) Designated Level Output: The first output shall be activated by the smoke detector(s) located in elevator lobbies other than the designated elevator lobby to initiate recall to the designated lobby.
        2) Alternate Level Output: The second output shall be activated by the smoke detector(s) located in the designated elevator lobby to initiate recall to the alternate level.
        3) Machine Room Output: The third output shall be activated by the elevator hoistway and/or machine room or machine space smoke detector(s) to initiate recall to the designated lobby.
            a) If the machine room or machine space is located at the same level as the designated lobby, the machine room or machine space smoke detector(s) shall activate the Alternate Level Output.
            b) In multi car applications, each hoistway detector shall activate a distinct warning output to all adjacent cars.
    c. Elevator control outputs shall consist of separately controlled NO/NC dry contacts from fire alarm individual addressable relay module(s) (Relay IAM).
    d. Install elevator control circuits from Relay IAMs to elevator control panel as directed by elevator system installer.
    e. Elevator control panel connection by elevator system installer.
2. Hoistway smoke detector
    a. Ceiling-mounted at top of hoistway.
    b. Provide ceiling-mounted remote alarm indicator/test switch in top floor of adjacent elevator lobby area.
3. Lobby smoke detector
    a. Ceiling–mounted within 21 feet from centerline of elevator door opening.
    b. Locations as indicated on the Drawings.
4. Machine room smoke detector
    a. Ceiling-mounted.
5. Machin space smoke detector (machine room-less application)
    a. Mounted on back-plane of machine equipment area. See detail on drawings.

G. Fire Sprinkler System Interface

1. When required, refer to "Elevator Fire Sprinkler/Power Module Switch Interface” Detail on the Drawings.

H. Entire installation to comply with elevator submittal drawings.

3.3 TESTING

A. Prior to final inspection, verify that elevator electrical systems and fire alarm interfaces are in proper working condition, free from false alarms.

B. Coordinate scheduling of all tests for elevator interfaces with elevator supplier, Local Fire Marshall or Fire Chief, and Owner.

END OF SECTION

SECTION 262913 – MOTOR STARTERS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide motor starters where shown and scheduled, or as required by Code.

B. Work Installed But Furnished Under Other Directives

1. Refer to Section 260500, Article 1.1, Paragraph D for extent of control devices furnished in other Divisions.

1.2 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500.
2. Show all details including electrical ratings, controls, schematic wiring diagrams, enclosure dimensions and other pertinent data.
3. Indicate on submittal exact motor or equipment served.

B. Record Manuals

1. Submit information in accordance with Section 260500.
2. Include installation and maintenance instructions accompanying the equipment.

PART 2 – PRODUCTS

2.1 GENERAL

A. Product of same manufacturer.

B. Sizing based upon Eaton equipment.

C. Other acceptable manufacturers: Approved equal units by Allen Bradley, Schneider, and Siemens.

D. Contractor is cautioned to verify all physical dimensions of "equal" units prior to accepting quotation for Bid.

2.2 SINGLE PHASE MOTORS WITH INTEGRAL OVERLOAD PROTECTION

A. Horsepower rated toggle switch, pilot handle where not in sight from motor.

2.3 SINGLE PHASE MOTORS WITHOUT INTEGRAL OVERLOAD PROTECTION

A. Manual Motor Starter

1. Manually operated toggle switch with integral overload protection.

2. Rendered inoperative unless thermal unit is in position.
3. Provide pilot light for manual starters not in sight from motor.
4. Provide flush-mounted starters with stainless steel plates.
5. NEMA 1 enclosures for surface-mounted starters unless otherwise required by environment.

B. Fused Toggle Switch

1. 4" square box mounting.
2. Complete with fuse adapter and plug fuse of correct rating.
3. Manufacturer: Bussmann or Reliance.
4. **Use only where specifically shown.**

2.4 THREE PHASE AND SPECIFIED SINGLE PHASE MOTORS

A. Across-the-line

1. Magnetic type, non-reversing unless otherwise scheduled.
2. Rated in accordance with NEMA standards, sizes and horsepower ratings.
3. Provide combination fusible unit with Class R fuse holders, where disconnect and starter are shown at the same location.
4. Minimum size: NEMA size 0.
5. Manufacturer's series: Eaton Freedom series, or approved equal units by Allen Bradley 512 series, Schneider 8538 series or Siemens Class 17 series.

6. Control
   a. 120 volt control transformer
   b. Control fusing:
      1) 250 volt - in accordance with NEC.
      2) 600 volt - primary and secondary fusing regardless of VA rating of control transformer.
   c. Cover-mounted devices for single-speed starters:
      1) Transformer operated LED green pilot light for running indication, with push-to-test feature.
      2) H-O-A selector switch, unless otherwise scheduled.
   d. Cover-mounted devices for two-speed starters:
      1) Transformer operated LED pilot lights for running indication, with push-to-test feature: Green for low speed, amber for high speed).
      2) High-low-off-auto selector switch, unless otherwise scheduled.
   e. Molded coil construction.

7. Overload Protection – exterior locations

   a. Resettable overload protection on all phases.
   b. Class 20 construction.
   c. Starter inoperative if one or more overload units removed.

8. Overload Protection – interior locations

   a. Self-powered.
   b. Solid state construction with adjustable overload protection on all phases.
   c. Manual reset with capability for remote reset function.
   d. Phase loss protection.
   e. Ambient-insensitive within operating range of -25°C to 55°C.
   f. Solid state construction, Class 20.

g. Starter inoperative if overload unit is removed.

9. Electrical Interlocks

a. Space for minimum three, any arrangement NO or NC.
b. Quantity: Two NO per starter.

B. Solid State Starters

1. Control and interlock options as previously indicated.
2. Run bypass contactor.
3. Class 20 overload protection.
4. Heavy-duty rating.
5. Temperature: NRTL-listed for -30 to 50°C ambient.
6. Rated for 4 starts per hour
7. Adjustable ramp times, torque control, and kick start.
8. Solid state reduced voltage type: Eaton 801+ Series.
9. Other acceptable manufacturers: As previously indicated.

2.5 THREE PHASE POWER MONITOR

A. Provide for all three phase motors larger than two horsepower, and all three phase compressor equipment.

1. Not required for motors served by solid state starters or variable frequency drives.

B. Line voltage to match system.

C. Operating parameters:

1. Trip: 90% rated voltage on any or all phases.
2. Reset: 93% rated voltage on all three phases.
3. Dead band between trip and reset: 3%.
4. Repeat accuracy: 1% maximum at 0-70°C.
5. Trip Delay Time: Two seconds.
6. Reset: Two seconds.
7. Output contact rating: Pilot Duty, 470 VA @ 600 VAC.
8. Transient Protection: 2500 Volts for 10 MS.

D. Special Options

1. NEMA 1 or 3R enclosure as required.
2. Adjustable Time Delayed Restart: 30-300 seconds. Set at 300 seconds.

E. Manufacturer: Motor Saver Model 350.

F. Other acceptable manufacturers: Eaton #D65 series.

2.6 PLYWOOD BACKING FOR SURFACE MOUNTED STARTERS

A. 3/4" grade AD, fire-resistant, painted gray (including edges).

PART 3 – EXECUTION

3.1 STORAGE

A. Store motor starters in cool, dry space prior to installation.

3.2 INSTALLATION

A. General

1. Plumb and level.
2. Install motor starters in accordance with Code, product listing and manufacturer's recommendations.
3. Tighten all lugs in accordance with manufacturer's recommendations.
4. Verify correct size overload protection with motor nameplate data and manufacturer's recommendations.
5. Where power factor correction is specified for connection to motor terminals (i.e. load side of overload units), reduce overload rating as per manufacturer's recommendations.
6. Provide 3/4" plywood backing where several controls are shown grouped for surface mounting.

B. Identification

1. Identify motor starters in accordance with Section 260553.
2. Provide two nameplates for all motor starters: One for starter, other for equipment. Do not mount equipment nameplate on motor. Rather, mount on equipment, in visible location near motor.
3. Do not use motor schedule numbers, but indicate motor or load served.
4. Provide pressure-sensitive tape identification in accordance with Section 260553 and 262813 for all motor starters containing fuses.
5. Indicate proper thermal overload unit by circling correct number on chart affixed to cover of starter.
6. Provide voltage markers for all motor starters containing a system voltage in excess of 250 volts to ground.
7. Voltage markers not required for motor starters which form a part of a motor control center as specified in Section 262419.

3.3 TESTS

A. Proper operation.

B. Correct rotation.

C. Solid state motor starters

1. Furnish letter of verification to Engineer indicating solid state motor starters have been tested by manufacturer’s representative.
2. List date of test and name of manufacturer’s representative.

3.4 INSTRUCTIONS

A. Manufacturer’s representative shall instruct Owner in proper maintenance and testing of solid state motor starters. Include name of Owner’s representative in letter of verification.

B. Record instructions and include with Record Manuals in accordance with Section 260500.

3.5 CLEANING

A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.

B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 263213 – GENERATOR SET

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. NFPA 110 Level 1, standby-rated, engine-generator set to supply emergency power to selected loads when normal power is not available.

B. Description of System

1. Upon failure of normal power, automatic transfer switch shall cause engine to start automatically, attain rated voltage and frequency, and transfer load.

1.2 SUBMITTALS

A. Submittals for Prior Approval to Quote

1. Refer to Section 260500 for "Prior Approval to Quote" procedure.
2. Clearly indicate following on cover letter of submittal:
   a. Combustion air CFM based on 110°F ambient.
   b. Cooling air CFM based on 110°F ambient.
   c. External static pressure capability of pusher fan (inches of water).
   d. Unobstructed volume of radiator core available for cooling, cubic feet.
   e. Heat rejection through cooling system.
   f. Heat rejection to generator room.
   g. Exhaust pipe size for particular distance of run.
   h. Muffler dimensions.
   i. Lift capacity of fuel pump.
   j. Location of nearest maintenance and repair facility under the ownership of the supplier.
   k. Any exceptions taken to technical requirements of Part 2, this Section.

B. Shop Drawings

1. Submit information in accordance with Section 260500.
2. Include complete data for maintaining and operating unit:
   a. Fuel requirements.
   b. Lubrication requirements.
   c. Exercising.
   d. Tests to be performed.
   e. Spare parts list.
   f. Trouble shooting guide.
   g. Description of operation.
3. Provide multiple copies. One to remain with generator and the other copies for Record Manuals.

C. Record Manuals

1. Submit information in accordance with Section 260500.
2. Include installation and maintenance instructions accompanying equipment.

3. Include written warranty and maintenance agreements.

1.3 QUALIFICATIONS

A. Manufacturer: Company specializing in package engine generator sets with minimum five years documented experience.

B. Supplier: Authorized distributor of engine generator manufacturer with service facilities within 350 miles of the project site.

PART 2 – PRODUCTS

2.1 GENERATOR SET

A. General

1. Fuel: #2 diesel or #1/winter blend as directed by Owner.
2. Engine driven, inline or V-type 4-cycle/stroke, 1,800 RPM with electronic governor.
3. Complies with current EPA regulations for nonroad engines of required hp.
4. Liquid cooled.
5. Furnish fuel pump, fuel filter with integral heater, and flexible fuel line.
6. Flexible fuel line to be braided metal, size as required.
7. Integral radiator with duct adapter.
8. Anti-vibration mounting pads between engine/alternator and base frame.
9. Heater
    a. Water jacket type.
        1) Thermostatically controlled.
        2) Sized to maintain adequate block temperature to ensure prompt starting.
        3) Provide engine mounted isolation valves to facilitate removal and replacement.
        4) Provide one per in-line engine and one per bank for vee type engines.
        5) Manufacturer: Kim Hotstart or equivalent by generator supplier.
10. Safety Shutdowns.
    a. NFPA 110 Level 1.
    b. Dedicated shutdowns: Not to be included with monitoring functions.

B. Rating

1. 480 Volt, 3-phase, and 200 kW ratings as shown on Drawings.
2. kW rating established at .8 power factor.
3. Adjust alternator size as required to accommodate large-motor starting transients and/or harmonics if applicable.
4. Voltage regulation + 2%, no load to full load.
5. 125° C temperature rise at full load.

C. Instrumentation

1. Electronic control panel, including (but not limited) to the following digital indications:
    a. Oil pressure.
    b. Coolant temperature.
    c. AC voltmeter, ammeter, voltmeter/ammeter switch.
    d. Running time meter.
    e. Frequency meter. Electronic type. Vibrating reed and dial type not acceptable.
    f. Integral start-stop engine controls.

g. 15 second crank with manual override.
h. NFPA 110 Level 1 safety indications.

2. Provide network interface module for web based access of all generator diagnostic information.

D. Remote Annunciator (TWO THUS)

1. Electronic control panel, including (but not limited) to the following digital indications:
   a. NFPA 110 Level 1 safety indications with separate LED for each item.
2. Visual and audible, with silence button on horn.
3. Include required remote manual emergency stop station. Note: It will be acceptable to have this station as a separate device located adjacent to the remote annunciator.

E. Output Circuit Breaker

1. 300/3 fully adjustable LSI trip breaker. Refer to Section 262416 for approved circuit breaker types.
2. Integral mounting. Field mounting not acceptable.

F. Manufacturer: Caterpillar #D200 GC series; or equivalent by MTU #6R0113 DS200 series.

2.2 SUB BASE FUEL TANK AND ACCESSORIES

A. General

1. Integral skid-mount type, with wiring accessibility for underground conduit runs.
2. Sized for minimum 24-hour full-load operation.
3. Integral low fuel and high fuel contacts for remote annunciation.
4. Double wall design with leak detection system.
5. Constructed and tested in accordance with UL 142.

B. Manufacturer: Klein, Tremont or equivalent by generator supplier.

2.3 MUFFLER

A. General

1. All welded construction.
2. Protected by high temperature, corrosion resistant coating.
3. Suitable for mounting in any position.
4. Rain cap, drip cap, and thimble.
5. Exhaust connector:
   a. Flexible.
   b. Stainless steel bellows type.
   c. 18" minimum length.
   d. Flanged connections for trade sizes 4" and larger.
   e. Drain plugs.

B. Size in accordance with manufacturer's recommendations, matched to specific engine use.

C. Rating: Critical.

D. Overall attenuation: 24 to 28 dBA.

E. Manufacturer: Riley Beaird, Inc., Maxim Silencer M41 series or equivalent by generator supplier.

F. Manufacturer: Riley Beaird, Inc., Maxim Silencer M51 series or equivalent by generator supplier.

2.4 STARTING BATTERIES

A. General

1. Industrial-grade lead acid.
2. Sized to provide three 15-second crank cycles.
3. Include battery tester, cables and clamps.
4. Tray conforming to NEC 480.8.
5. Battery heating pad.
   a. Manufacturer: Kim #KB series with #AL-S thermostat or equivalent by generator supplier.

2.5 BATTERY CHARGER

A. Cabinet

1. Wall-mount with NEMA 1 or 3R type enclosure as required by location.

B. Indicators

1. DC ammeter.
2. DC voltmeter.

C. Electrical Characteristics

1. Overload protection.
2. Silicon diode full wave rectifiers.
3. Voltage surge suppressor.
4. Fused AC input.
5. 120 volt single phase input + 10%.
6. Float range (Volts DC per cell @ 25° C): 2.15-2.19.
7. Equalize range (Volts DC per cell @ 25° C): 2.25-2.45.
8. Charger to automatically select equalize mode whenever normal power is restored. Automatically switches back to float mode when normal equalizing potential reached.
9. Capacity: Sized for specific batteries utilized, to prevent undercharging and overcharging.

D. Manufacturer: Master Control System #MBC6 series.

E. Other acceptable manufacturers: La Marche or equivalent by generator supplier.

2.6 PROTECTIVE HOUSING

A. Weather-resistant

1. The engine generator set shall be factory-enclosed in heavy gauge steel enclosure:
   a. Constructed with corner posts, coated with electrostatically applied zinc and finished with baked enamel paint (color as selected by Owner from standard color options).
   b. With large easily opened doors to allow access to the engine, generator and control panel. Each door shall be fitted with stainless steel, lockable hardware, with identical keys. padlocks do not meet this Specification.

c. Mounted on the generator frame and shall include 2" Aeroflex or equivalent insulation with motor-operated intake and pressure exhaust damper (dampers shall be located on opposite ends of the enclosure). Motor-operated dampers shall be spring operated to open and motor closed.
d. With snow hoods (intake and exhaust).
e. Muffler shall be integral to enclosure (not mounted on top of enclosure). Rain cap included. Attenuation as required to meet overall requirements.
f. Package shall be pre-wired. All block heaters, battery chargers, unit heaters, etc. shall be wired by the manufacturer, facilitating a single point connection to a load center or fused terminal strip in the field.
g. With vermin proofing.
h. Sound levels shall be less than 79 dBA with full load at 7 meters.

2.7 FUEL POLISHER

A. Compact packaged apparatus including programmable controller, replaceable 3 micron water block filter, magnetic conditioner, and pump.

B. Capable of polishing up to 640 gallons of fuel in 8 hours, 1.3 GPM flow rate.

C. AXI International #FPS-DX-S or approved equal.

D. Fuel polisher shall be factory installed/wired/plumbed inside the Generator Protective Housing.

2.8 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Fuses: One for each type and rating used.
2. Indicator Lamps: Two for each type used.
3. Filters: Three additional sets of each fuel, oil, and air filter elements required for the engine.
4. Fuel Polisher: Three additional water block filters and water block strainer baskets.

PART 3 – EXECUTION

3.1 STORAGE

A. Store generator in a cool, dry space prior to installation.

3.2 INSTALLATION

A. Install generator in accordance with Code, product listing and manufacturer's recommendations.

B. Provide Electrical Circuitry/Connections.

1. Generator Power.
2. Generator Engine Start Accessories.
   a. Batteries.
   b. Battery Charger: 20/1 circuit breaker.
   c. Battery heating pad: Same circuit as battery charger.
   d. Ignition.

3. Generator Engine Heaters
    a. Water jacket heater: 20/1 or 30/2 circuit breaker as required.
4. Fuel System.
    a. Tank float switch.
    b. Solenoid valve - DC from engine.
5. Remote Annunciator
    a. Generator.
    b. Tank float switch.
    c. Rupture alarm float switch.

C. Provide network cabling in accordance with Division 27.

1. Provide one cable, category type as required by Section 271500, from nearest data rack patch panel to generator. Provide conduit for cable for any exterior locations, or in exposed ceiling areas, to nearest cable tray. Cable may extend in cable try to data rack. If no cable tray is available, extend cable above accessible ceiling spaces with proper supports as per Section 271500. Where any portion of cable is installed in conduit below grade, provide water-blocked cable.

D. Concrete Pad

1. Locate generator on concrete pad.
2. Dimensions: 8" high and extend minimum 8" from all sides of frame.
3. Verify and maintain required clearances as per manufacturer's recommendations.
4. Provided by Division 26. Coordinate installation.

E. Mount remote annunciator panel where indicated on Drawings. Provide raceway system and conductors as required.

3.3 START-UP AND TESTING

A. Supplier of generator shall provide the services of a factory-trained technician at start-up and testing of the installation.

B. Notify owner, engineer, and local fire Marshall or Fire Chief one week in advance of scheduled testing. Division 26 Contractor responsible for test coordination and scheduling.

C. A fuel allowance of $2,000 for onsite setup and initial testing shall be included in the bid. Fuel allowance shall be used to fill tank to maximum amount possible for allowance amount. Supplier shall use any remaining fuel allowance to refill tank after testing. Supplier shall provide actual fuel receipts with test reports to verify fuel amount filled. Any allowance amount remaining after testing refill is completed shall be credited back to the Owner via change order.

D. Factory-trained technician to perform tests as required and adjustments as needed. Tests shall include, but not be limited to:

1. Phase Rotation Test (phase rotation to match normal power).
2. Function test of all engine shutdown features such as low oil pressure, over-temperature, over-speed.
3. Vibration test.
4. Measure system charging voltage and individual cell voltages.
5. Measure electrolyte specific gravity and level.
6. Resistance load bank test:

a. Stepped sequence, no load to full load, timed for proper engine "break-in" to ensure proper ring seating.
b. Dry-type bank.
c. Two hours under full load.
d. Perform at project site.
e. Provide written report for Record Manuals.

7. Automatic transfer switch operation and adjustment.

E. Furnish letter of verification to Engineer indicating that the generator system has been tested by the manufacturer's factory-trained technician and is found to be complete and functional. List date of testing, name of factory-trained technician, and names of any other persons in attendance.

3.4 INSTRUCTIONS

A. The generator supplier factory-trained technician shall instruct the Owner in proper operation, maintenance and testing of the complete generator system. Indicate on letter of verification, name of Owner's representative receiving instructions.

B. Record instructions and include with Record Manuals in accordance with Section 260500.

3.5 WARRANTY

A. Warranty shall be for a period of two years from date of project substantial completion, and shall include defective parts, workmanship, labor, mileage and travel time. Running hours shall not be limiting factor.

B. Provide written warranty agreement

3.6 MAINTENANCE SERVICE

A. At substantial completion, begin 24 months full maintenance servicing by skilled employees of the manufacturer's designated service organization. Include quarterly exercising to check for proper starting, load transfer, and running under load. Include routine preventative maintenance as recommended by the manufacturer and adjusting as required for proper operation. Maintenance service shall include parts and supplies as used in the manufacture and installation of the original equipment along with all required labor, mileage, and travel time.

B. Provide written maintenance agreement.

END OF SECTION

SECTION 263353 – UNINTERRUPTIBLE POWER SUPPLY SYSTEM

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Furnish and install a complete Static Uninterruptible Power Supply (UPS) System incorporating:
   a. UPS module containing a Rectifier, Inverter, Battery Charger, Static Bypass, and associated Control and Monitor Panel.
   b. Lithium Ion Battery string(s) in Battery Cabinet.
   c. Line-and-Match accessory cabinet for transformer and distribution applications with dual feed maintenance bypass (four-breaker bypass) capability.

B. Description of System

1. Normal Operation: The critical load shall be continuously supplied by the inverter. The rectifier/charger shall derive power from the AC source and shall supply DC power to the inverter while simultaneously float-charging the battery.
2. Emergency Operation: Upon fail of AC power, the critical load shall continue to be supplied by the inverter, which without any switching, shall obtain power from the batteries. There shall be no interruption to the critical load upon failure or restoration of the AC source.
3. Recharge Mode: Upon restoration of the AC source, the rectifier/charger shall recharge the batteries and simultaneously shall provide power to the inverter. This shall be an automatic function and shall cause no interruption to the critical load.
4. Bypass Mode: If the UPS must be taken out of service for overload, load fault, or internal failures, the static bypass switch shall automatically transfer the load to the AC source. Returning to Normal Operation shall also be automatic (for non-failure bypasses). No-break transfer to and from bypass mode shall be capable of being initiated manually from the control panel.
5. Energy Saver: The UPS shall continuously monitor the voltage and frequency of the bypass source. When the source parameters are within acceptable limits, the UPS will utilize a minimal/optimal combination of its internal subsystems to ensure acceptable power is always delivered to the critical load, at a system efficiency of 99% or greater, over the range of 10% to 100% load. The Energy Saver System shall be enabled by the user, and shall be adjustable. It shall incorporate a “High Alert Mode” to automatically (without user intervention) provide maximum power conditioning any time bypass source variation levels exceed preset, adjustable limits. When Energy Saver System is utilized, the UPS must attenuate ANSI C62.41-type line transients to within IEC and ITIC limits. The Energy Saver System shall be able to distinguish between upstream (utility) faults and downstream (load) faults, and react appropriately to protect and support the critical load, without interruption.

1.2 SUBMITTALS

A. Shop Drawings

1. Provide information in accordance with Section 260500.
2. Indicate:
   a. General description and technical data.
   b. Receiving and installation instructions
   c. Operating procedures.

d. UPS module description.
e. Battery description.
f. One-line diagram of system.
g. Equipment outline drawings.
h. Interconnection drawings.
i. Battery wiring diagram.
j. Battery performance data.

B. Record Manuals

1. Provide information in accordance with Section 260500.
   a. Include fault current available at incoming terminals. Fault current calculations shall be based on actual installation criteria (conductor lengths, raceway types, etc.)

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Sizing and design based upon Eaton Corporation 93PM series equipment. Eaton Corporation catalog numbers used for reference.

B. Other acceptable manufacturers: Refer to Specification 260500.

C. Contractor is cautioned to verify all physical dimensions of "equal" units prior to accepting quotation bid.

2.2 GENERAL

A. Uninterruptible Power Supply.

1. Rectifier/charger: The rectifier/charger shall convert incoming AC power to a regulated DC output for supplying the inverter and for charging the battery. The rectifier/charger shall be a high-frequency PWM design, using Insulated Gate Bi-polar Transistors (IGBTs).
2. Inverter: The inverter shall be a transistorized, three-legged, pulse-width-modulation (PWM) design. It shall be capable of providing the specified output power while operating from any DC source voltage (rectifier or battery) within the specified DC operating range.
3. Batteries: The batteries shall be sealed, maintenance-free, high-rate discharge, Lithium-Ion cells. Their expected life shall be ten years or 200 complete full-load discharge cycles when operated and maintained within specifications.
4. Battery Management:
   a. The battery management system shall provide battery time remaining while operating in normal mode and battery mode. Battery time available information shall be displayed real-time, even under changing load conditions.
   b. The battery management system shall automatically test the battery string(s) to ensure that the battery is capable of providing greater that 80% of it’s rated capacity. Testing the batteries shall not jeopardize the operation of the critical load. Upon detection of the battery string(s) not capable of providing 80%, the UPS system will alarm that the battery needs attention/replacement.
   c. The battery cabinet shall feature valve regulated, high-rate discharge, lead-acid batteries which provide energy to the support the critical load during a momentary loss of input power to the rectifier. The batteries shall be flame retardant in accordance with UL 94V2 requirements.

1) Power wiring internal to each battery cabinet shall be factory provided. Each battery cabinet shall feature up to 10 battery trays which can be individually disconnected from the battery cabinet power wiring with quick disconnect devices.
2) Each battery cabinet shall feature a DC rated circuit breaker. The circuit breaker within the battery cabinet shall only provide protection to the battery string within that battery cabinet. The circuit breaker in each battery cabinet shall feature an A/B auxiliary switch. The UPS module shall be capable of monitoring and alarming an open battery cabinet circuit breaker condition.
3) The circuit breaker in each battery cabinet shall feature a 48VDC under voltage release device. The UV device shall operate to trip the battery breaker(s) for an emergency power off command or battery disable command.

5. Static Switch: This shall be a naturally committed, full-rated, high-speed, solid-state transfer device rated for continuous duty operation. It shall provide the following transfer and retransfer operations:
   a. Uninterrupted transfer to bypass shall be automatically initiated for the following conditions:
      1) Output overload period expired.
      2) Critical bus voltage outside of specified units.
      3) Overtemperature period expired.
      4) UPS failure.
   b. Uninterrupted manual transfers shall be initiated from the control panel.
   c. Uninterrupted automatic retransfer shall occur whenever the inverter is capable of assuming support of the load.
   d. Uninterrupted automatic retransfer shall be inhibited for the following conditions:
      1) When transfer to bypass is activated manually or remotely.
      2) In the event of multiple transfer-retransfer operations, the control circuitry limits "cycling" to three (3) operations to any ten-minute period.
      3) UPS failure.
   e. All transfers and retransfers shall be inhibited for the following conditions:
      1) Bypass voltage out of specified limits (+10% of nominal).
      2) Bypass frequency out of specified limits (+0.5 Hz).
      3) Bypass out of specified sync range.
   f. Manual bypass switch: This switch supplies power directly to the bypass section of the output transformer to permit servicing of the bypass static switch without interrupting the critical load. The manual bypass switch is housed in the base UPS's cabinet.
   g. Monitoring and control components: The following components shall provide monitor and control capability:
      1) Microprocessor-controlled circuitry.
      2) Control panel with status indicators, alarms, and metering displays.
      3) Building alarm monitor.
6. Distribution Section (IAC-D)
   a. K-1 Rated 480 V primary, 120/208 V secondary output isolation transformer.
   b. Two 200/3 LSI distribution breakers. See specification 262816 for LSI requirement details.
   c. One 20/2 circuit breaker for battery management system.
7. Bypass Cabinet (SIAC-B)
   a. Four-Breaker bypass style for dual feeds.
   b. Manual maintenance bypass circuit breakers shall provide complete isolation of UPS for servicing and, if necessary, complete removal and replacement of UPS while still providing bypass power to critical load.
      1) Rectifier Input Breaker (CB1)
      2) Bypass Input Breaker (CB2)
      3) Maintenance Bypass Breaker (CB3)
      4) Maintenance Isolation Switch (CB4)

B. System Rating and Operating Characteristics

1. System continuous ratings:
   a. 80kW
   b. Minimum Emergency Operation time of 15 minutes at 100% load.
2. System input:
   a. Nominal input voltage: 480 VAC, 3-phase, 3-wire ground.
   b. Operating input voltage range: +10%, -15% of average nominal input voltage without battery discharge.
   c. Operating input frequency range: +3 Hz of nominal.
   d. Input power factor range: 0.99 lagging.
   e. Input current total harmonic distortion (THD): Less Than 5%.
   f. Magnetizing inrush current: Typically 800% of the largest model's full load rectifier input current. The input isolation transformer option doubles this value.
3. System output
   a. Nominal output voltage: 208Y/120VAC.
   b. Steady-state voltage regulation (on inverter): Within +1% average from nominal output voltage.
   c. Manual output voltage adjustment: +5% from nominal.
   d. Transient voltage response: Within +5% from nominal voltage for a 100% load step, full load retransfers and full drop on battery.
   e. Transient voltage recovery: 25 ms to within +1% of nominal.
   f. Line sync range: +0.5 Hz.
   g. Frequency regulation: +0.1 Hz free running.
   h. Frequency slew rate: 1 Hz/s maximum.
   i. Phase angle control:
      1) Balanced linear loads: +1 degree from nominal 120 degree.
      2) Unbalanced linear loads: +1 degree for each additional 10% unity load unbalance (up to 50% unbalance) from nominal 120 degrees.
   j. Phase voltage control:
      1) Balanced linear loads: +1% from average phase voltage.
      2) Unbalanced linear loads: +1% for each additional 10% of unity load unbalance (up to 50% unbalance) from average phase voltage.
   k. Output voltage total harmonic distortion (THD): 3% (1% single) for 100% linear load; typically 10% at 50% balanced linear/non-linear load.
   l. Overload current capability (with nominal line and fully charged battery): 125% for ten minutes maintains voltage regulation.
   m. Fault clearing capability: 160% phase-to-phase for ten cycles; 160% phase-to-neutral for ten cycles.
   n. Static transfer time: Make-before-break transfer completed in less than four ms.
   o. Common mode noise attenuation (both in normal and bypass mode of operation): -65 dB up to 20 kHz, -40 dB up to 100 kHz.
4. Efficiency: System efficiency at full unity power factor load and nominal input voltage shall be 91 percent.

C. Cabinet

1. Enclosures: The UPS shall be housed in free-standing, double-front enclosures equipped with casters and leveling feet.
2. Ventilation: The electronics cabinets shall be designed for forced-air cooling, and the battery cabinets(s) shall be designed for convection cooling.
3. Cable entry: Standard cable entry for the module shall be through the top or bottom of the cabinet.

4. Front access: Major sub-assemblies shall be modular and capable of being replaced from the front of the UPS.

D. Battery

1. Battery type: Sealed, maintenance-free, high-rate discharge, Lithium-ion batteries.
2. Nominal battery string voltage: 466-486 VDC.
3. Minimum voltage: 410VDC.
4. UL 1973 listed.
5. UL 9540A tested/passed to prevent thermal runaway fire propagation outside the enclosure.
6. Integral battery management system operating independent of the UPS.
7. Manufacturer: Samsung

E. Controls and Indicators

1. Microprocessor-controlled circuitry: Full automatic operation of each UPS module shall be provided through the use of microprocessor-controlled logic. All operating and protection parameters shall be firmware controlled, thus eliminating a need for manual adjustments. Start-up and transfers are automatic functions.
2. Digital Front Panel Display: The UPS control panel shall be a digital front panel display that features an 8x40 (8 lines, each with 40 characters) backlit LCD display. The LCD shall display UPS status, metering, battery status, alarm/event queue, active alarms and UPS configurations. The front panel display shall show a system mimic diagram with an outlined power path, current operating mode and event logs
3. Control panel indicators: The UPS module shall be equipped with a control panel providing the following monitoring functions (and each alarm condition shall be accomplished by an audible alarm):
    a. Unit normal: This shall indicate that the commercial AC utility or generator source is supplying power to the rectifier and the inverter is supporting the critical load. A text message shall indicate if the bypass line is not within tolerance.
    b. On battery: This shall indicate that the commercial AC utility or generator source has failed and the battery is supplying power to the inverter, which is supporting the load. A text message shall indicate if the battery charge is low or if the battery is installed but disconnected.
    c. On bypass: This shall indicate that the UPS has transferred the load to the bypass circuit.
    d. Minor alarm: This shall indicate that the UPS detects an alarm condition, outlined in detail in the operator's manual:
4. Control Panel Controls: The UPS control panel shall provide the following functions from front panel push buttons:
    a. EVENTS: Displays the list of Active System Events and a historical log of system events. Historical logs shall include a detailed time stamped list of the latest 128 events.
    b. METERS: Displays performance meters for the system or critical load. When selected, the front display shall show individual screens of input parameters, output parameters or bypass parameters including; voltage, current and frequency. In addition, the Flywheel display shall show runtime remaining.
    c. CONTROLS: Displays a System Controls screen. Allows selection of operating mode, normal, bypass, charger on/off and Power Module on/off.
    d. SETUP: Allows display contrast, date and time information serial communication port configuration and display of firmware revision numbers.
    e. RETURN: Confirms selection or returns to previous screen.
5. Interface panel: The UPS shall be equipped with an interface panel, located behind a protective cover, which provides the following signals and communication features in a Class 2 environment.

a. Alarm contact: A dry contact for annunciating a summary alarm shall be provided for customer use. This contact shall be Form "C" capable of supplying both N/O and N/C contacts. Contact ratings shall be 5A max at a voltage not to exceed 28VDC or 277VA.
b. RS232 (EIA / TIA-232) communications interface: Circuitry shall be provided for one RS232 (EIA / TIA-232) communication port for connection to automated service department diagnostic tools. This port may be used with simple ("dumb") terminals to gain remote access to all unit operation information.
c. Building alarms: Two inputs shall be provided for monitoring the status of external dry contacts. Building alarms shall be set up through the UPS configuration mode function on the RS232 (EIA / TIA-232) port.
d. External EPO contacts: Shall be provided to connect an external remote emergency power off switch to shutdown the UPS and de-energize the critical load.

6. System protection:
   a. Rectifier/Charger and Bypass protection shall be provided through individual fusing of each phase.
   b. Electronic current limiting circuitry and fuses in the Inverter circuit shall provide output protection.
7. Accessories
   a. SNMP Network Adapter and UPS Power Monitoring Software: SNMP adapters shall provide a communications interface between the UPS module and SNMP-compatible network management systems. This capability shall allow the unit to be monitored remotely over an Ethernet network using a standard web browser.

PART 3 – EXECUTION

3.1 STORAGE

A. Store all uninterruptible power supply system components in a cool, dry space prior to installation.

3.2 INSTALLATION

A. General

1. Install in accordance with code, product listing, and manufacturer's recommendations.
2. All equipment to carry product listing, and shall be furnished by manufacturer to ensure equipment compatibility, and product listing.
3. Wiring to comply with all National, State and Local Fire Codes.

3.3 TESTS

A. Factory start-up shall be provided. Start-up service shall be provided at no extra charge and shall include a minimum of one visit to perform all procedures and tests specified within UPS Installation and Operation manual.

B. Furnish a letter of verification to Engineer indicating that the system has been tested and is found to be complete and functional. List date of test and name of testing representative. Testing to include a functional test of all devices and verification of proper supervision for all new devices. Notify Owner minimum of one week in advance of scheduled tests.

3.4 INSTRUCTIONS

A. Manufacturer's representative shall instruct Owner to proper operation maintenance and testing of complete uninterruptible power supply system. Indicate on letter of verification, name of Owner's representative receiving instructions

B. Record instructions and include with Record Manuals in accordance with Section 260500.

3.5 CLEANING

A. **Clean** and **vacuum** interior to remove all wire and insulation scraps, dust and dirt.

B. Clean all exposed surfaces immediately prior to final inspection.

3.6 WARRANTY

A. UPS: The UPS shall come with a 36-month warranty on all mechanical, electrical, and electronic components. Parts, labor, and travel to the site shall be included during the warranty period.

B. Batteries: Batteries shall come with a 36-month full warranty. Parts, labor, and travel to the site shall be included during the warranty period.

C. Warranty shall start on the date the project is substantially complete and accepted by the Owner. This may not be the same date as when the UPS units are factory started.

3.7 MAINTENANCE SERVICE

A. At substantial completion, begin 24 months full maintenance servicing by skilled employees of the manufacturer's designated service organization. Include routine preventative maintenance as recommended by the manufacturer and adjusting as required for proper operation. Maintenance service shall include software and firmware updates, parts and supplies as used in the manufacture and installation of the original equipment along with all required labor, mileage, and travel time.

B. Provide written maintenance agreement.

END OF SECTION

SECTION 263600 – TRANSFER SWITCHES

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide transfer switch for standby power system, in accordance with NFPA 110 Level 1, as shown on Drawings, and specified herein.

B. Description of System

1. Automatic transfer switch to stop and start emergency generator and transfer load from normal to emergency source.

    a. ATS #C1 will be the master switch to start-up and exercise the generator.
    b. ATS #C2 and LS will be slaves.

1.2 QUALITY ASSURANCE

A. UL Standard 1008.

B. To ensure coordinated equipment operation and performance, and to centralize responsibility, equipment covered by this Section shall be furnished and warranted by the same supplier as the emergency generator.

1.3 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500.
2. Include:
    a. Amperage.
    b. Voltage.
    c. Phase pole quantity and neutral configuration.
    d. Dimensions.
    e. Installed weight.
    f. Electrical connections.
    g. Time delays.
    h. Enclosure type.
    i. Short circuit withstand rating.
    j. Any other pertinent information.

B. Record Manuals

1. Submit information in accordance with Section 260500.
    a. Include fault current available at each set of lug terminals. Fault current calculations shall be based on actual installation criteria (conductor lengths, raceway types, etc.). Provide separate calculation from normal power source and alternate power source; indicate calculated values for each.

2. Include manufacturer's instructions for maintaining and operating the transfer switch, including repair parts list, adjusting time delay relays, troubleshooting guide, wiring schematics and etc.
3. Provide multiple copies: One to remain with transfer switch, other copies for Record Manuals.

PART 2 – PRODUCTS

2.1 AUTOMATIC TRANSFER SWITCH #C1 (ATS #C1)

A. Ampere rating, voltage rating and phase pole quantity as indicated on the Drawings or as required by generator full load ampere rating.

B. Use rating shown on standard specification sheet. Special ratings not acceptable.

C. Mechanically held with closed transition.

D. Solid neutral.

E. Time Delays

1. NFPA 110 Level 1.
2. Engine starting, adjustable .5 to 6 seconds. Factory set at one second.
3. Transfer to emergency after emergency source attains 90% of rated voltage and 95% of rated frequency, adjustable 0 to 5 seconds. Factory set at .5 seconds.
4. Retransfer to normal, adjustable 0 to 30 minutes. Delay automatically bypassed if emergency source fails and normal source is available. Factory set at 20 minutes.
5. Engine cool down, adjustable 0 to 5 minutes. Factory set at 5 minutes.

F. Test switch to momentarily simulate normal source failure.

G. Auxiliary contacts, two NO-NC rated 10 amps, 480 V 60 Hz.

H. Source identification signal lights.

I. Microprocessor Controller:

1. Undervoltage, overvoltage, underfrequency, overfrequency and voltage unbalance monitoring of both normal and emergency sources.
2. Adjustable dropout and pickup set points for all five situations.
3. Phase monitoring to control inrush currents at transfer.
4. Generator exercising to be 7-day programmable with selectable “load” or “no load” testing.
5. LCD display with keypad for menu driven control of set points, time delays and generator exerciser functions.
6. Real time clock with battery backup.

J. Include Ethernet communication module for network interface capabilities. Allows web based access to all parameters available at HMI.

K. Provide additional relay monitoring and control to comply with serving utility’s requirements for closed transition.

1. Extended Parallel alarm relay.
2. 86A lock-out relay with manual reset.

L. Manufacturer: ASCO 7000 series.

M. Other acceptable manufacturers: Approved equal units by Russelectric Inc. (RMT series).

2.2 AUTOMATIC TRANSFER SWITCH #C2 and LS (ATS #C2 and ATS #LS)

A. Ampere rating, voltage rating and phase pole quantity as indicated on the Drawings or as required by generator full load ampere rating.

B. Use rating shown on standard specification sheet. Special ratings not acceptable.

C. Mechanically held with open transition.

D. Solid neutral.

E. Time Delays

1. NFPA 110 Level 1.
2. Engine starting, adjustable .5 to 6 seconds. Factory set at one second.
3. Transfer to emergency after emergency source attains 90% of rated voltage and 95% of rated frequency, adjustable 0 to 5 seconds. Factory set at .5 seconds.
4. Retransfer to normal, adjustable 0 to 30 minutes. Delay automatically bypassed if emergency source fails and normal source is available. Factory set at 20 minutes.
5. Engine cool down, adjustable 0 to 5 minutes. Factory set at 5 minutes.

F. Test switch to momentarily simulate normal source failure.

G. Auxiliary contacts, two NO-NC rated 10 amps, 480 V 60 Hz.

H. Source identification signal lights.

I. Microprocessor Controller:

1. Undervoltage, overvoltage, underfrequency, overfrequency and voltage unbalance monitoring of both normal and emergency sources.
2. Adjustable dropout and pickup set points for all five situations.
3. Phase monitoring to control inrush currents at transfer.
4. Generator exercising to be 7-day programmable with selectable “load” or “no load” testing.
5. LCD display with keypad for menu driven control of set points, time delays and generator exerciser functions.
6. Real time clock with battery backup.
7. Include Ethernet communication module for network interface capabilities. Allows web based access to all parameters available at HMI.

J. Manufacturer: ASCO 300 series.

K. Other acceptable manufacturers: Approved equal units by Russelectric Inc. (RMT series).

PART 3 – EXECUTION

3.1 STORAGE

A. Store transfer switch in a cool, dry area prior to installation.

3.2 INSTALLATION

A. Install transfer switch in accordance with Code, product listing, and manufacturer's recommendations.

B. Securely mount transfer switch and accessories where shown on Drawings.

C. Provide all control and power wiring/connections.

D. Provide network cabling in accordance with Division 27.

1. Provide one cable, category type as required by Section 271500, from nearest data rack patch panel to transfer switch. Provide conduit for cable for any exterior locations, or in exposed ceiling areas, to nearest cable tray. Cable may extend in cable try to data rack. If no cable tray is available, extend cable above accessible ceiling spaces with proper supports as per Section 271500. Where any portion of cable is installed in conduit below grade, provide water-blocked cable.

3.3 TESTS

A. Test in conjunction with generator.

3.4 INSTRUCTIONS

A. Manufacturer’s representative shall instruct Owner in proper operation, maintenance and testing of complete transfer switch system. Representative shall assist the Owner in programming an exercise schedule that meets NFPA 110 Level 1 requirements. Indicate on Section 263213 letter of verification, name of Owner’s representative receiving instructions.

B. Record instructions and include with Record Manuals in accordance with Section 260500.

3.5 CLEANING

A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.

B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 264313 – SURGE PROTECTIVE DEVICES

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide integral Surge Protective Device in panelboards and switchboards where indicated and scheduled.

1.2 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500.

B. Record Manuals

1. Submit information in accordance with Section 260500.
2. Include installation and maintenance instructions accompanying equipment.

PART 2 – PRODUCTS

2.1 TYPE 2 SURGE PROTECTIVE DEVICE (SPD)

A. Provided only in panelboards and switchboards as indicated on the drawings.

B. The panelboard/switchboard manufacturer shall internally install SPD protection within the panelboard and the entire assembly shall be UL 67 listed.

C. SPD requirements:

1. Listed and component recognized in accordance with latest editions of UL 1449, UL 96A and UL 1283.
2. Minimum surge capacity ratings as indicated on the drawings. Operating voltage and configuration as indicated on the drawings
3. 200kA Short Circuit Current Rating (SCCR). SPD devices obtaining SCCRs using upstream over current protection are prohibited.
4. 20kA nominal discharge current.
5. EMI/RFI noise filtering attenuation up to 50dB for 10kHz – 100MHz.
6. Self contained module design, with each suppression element metal-oxide varistor (MOV) based incorporating thermal protection. End of life mode shall be open circuit.
7. Surge current diversion paths between each phase conductor and the neutral conductor, between each phase conductor and the ground and between the neutral conductor and ground. For delta configured systems, the SPD shall have components connected between each phase conductor and between each phase conductor and ground.

8. UL 1449 latest edition listed and recognized component voltage protection rating (VPR) shall not exceed:

VOLTAGE	L-N	L-G	N-G	L-L
240/120 1Ø	700V	700V	700V	1200V
208Y/120	700V	700V	700V	1200V
240D/120	700/1200V	700/1200V	700V	1800V
480Y/277	1200V	1200V	1200V	2000V

9. Designed to withstand a maximum continuous operating voltage (MCOV) of not less than 115% of nominal RMS voltage.
10. Equipped with on board visual and audible diagnostic monitoring devices mounted on the front cover of the SPD.
    a. Indicating lights shall provide full time visual diagnostic monitoring of the operational status of each phase of the surge current diversion module.
    b. Audible diagnostic monitoring shall be by way of audible alarm. This alarm shall activate upon a fault condition. An alarm on/off switch shall be provided to silence the alarm.
    c. LCD display surge counter located on the front cover of the SPD. Counter shall be equipped with a manual reset with protection from accidental operation and utilize non-volatile memory.
    d. A set of Form "C" dry contacts shall be provided for remote annunciation.
11. Warranty: The panelboard manufacturer shall warranty the SPD for full replacement if destroyed by transients, including lightning, for a period of ten (10) years.

PART 3 – EXECUTION

3.1 INSTALLATION

A. SPD protection modules shall be factory installed by the panelboard/switchboard manufacturer integral to the panelboards/switchboards indicated on the drawings. Each entire assembly shall be UL 67 listed.

3.2 TESTS

A. Verify all SPD equipment is active and in proper working condition prior to final project inspection.

3.3 CLEANING

A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.

B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 265100 - LUMINAIRES

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Furnish and install a complete luminaire for each lighting outlet.

1.2 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500 including voltage, housing and door frame material, lens type, diffuser thickness and lamp quantity and type.

B. Record Manuals

1. Provide information in accordance with Section 260500.

1.3 COORDINATION

A. Confirm compatibility and interface of luminaire with other materials and job conditions prior to ordering. Report discrepancies to Engineer and defer ordering until clarified.

B. Provide frames, trim rings, and backboxes as required.

C. Coordinate with work of all other Divisions to avoid conflicts between luminaires, supports, fittings and mechanical equipment. Ceiling clearances are minimal. It is imperative that Contractors coordinate conduit and duct runs to facilitate luminaire installation as shown on reflected ceiling plans. Engineer will not be responsible for interferences arising from lack of field coordination between trades.

PART 2 – PRODUCTS

2.1 LUMINAIRES

A. General

1. UL or other NRTL listed.
2. Where shown to be installed in fire-rated assemblies, luminaires shall be listed in accordance with UL Standard 1598. Supplemental penetration protection (tenting) will be accomplished by General Contractor in accordance with UL Fire Resistance Directory. Coordinate installation with General Contractor. Supplemental protection shall be spaced minimum 1/2" away from the luminaire, per UL Standard 1598.
3. Verify ceiling finishes and equip all recessed luminaires with appropriate frames as required.
4. Furnish luminaires intended for use in lay-in grid ceilings with proper clips for compliance with NEC.
5. Refer to Section 260500 for "Prior Approval to Quote" procedure.

B. LED Lighting Systems

1. General: All LED lighting system components must be UL or other NRTL listed.
2. Engines/lamps:
   a. Meets or exceeds 70% lumen maintenance at 50,000 hours based on IESNA LM-79-2008.
   b. Minimum 80+ CRI rating.
   c. 4000K color temperature, or as scheduled on drawings.
   d. Minimum delivered lumens as scheduled on drawings.
3. Electronic drivers for LED's:
   a. Factory installed.
   b. Multi-volt for use on either 120v or 277v systems.
   c. THD: < 20%.
   d. Factory installed quick-disconnect plug internal to the luminaire for driver removal.
   e. Rated for a minimum of 50,000 hours.
   f. 0-10 Volt dimming standard. Provide non-dimming drivers only as scheduled.
      1) Controls and wiring as per manufacturer's recommendations. Provide power packs for wall-box dimmers as required for positive luminaire off.
4. Downlights shall incorporate integral diffuser type lens. Exposed modules not acceptable.
5. Emergency battery packs:
   a. Include self-testing/self-diagnostics with audible alarm option.
   b. Factory installed.
   c. Minimum lumens as scheduled.
6. Spare Drivers:
   a. Provide 3% spare drivers of each type, minimum of one, maximum of three. Emergency battery packs not included.
   b. Luminaire manufacturer shall keep reasonable driver stocks on hand for replacement of defective drivers under guarantee period.
7. Guarantee period: Minimum 60 months from date of substantial project completion.
   a. Guarantee shall include all parts and labor required to bring luminaire to complete operation.
   b. Labor shall be performed by an Owner approved Electrical Contractor licensed in the area the work is to be performed.
   c. Any costs for equipment rentals required to service luminaires under warranty shall be the responsibility of luminaire manufacturer.

PART 3 – EXECUTION

3.1 STORAGE

A. Store luminaires in a cool, dry space prior to installation.

3.2 INSTALLATION

A. General

1. Install luminaires plumb and true, free of light leaks, warps, dents and other irregularities.
2. Equip any outlets not specifically labeled with a luminaire the same as those in rooms used for similar purposes.
3. Run all lamps the same direction in rooms, corridors and other adjacent areas that contain square luminaires.
4. Continuous row luminaires: Hang level in straight line and butt tightly together.

5. Verify exact location of luminaires with reflected ceiling plan. Any discrepancies between the lighting plan, reflected ceiling plan, or installed ceilings shall be brought to the attention of the Engineer for clarification prior to installation.
6. Coordinate with Mechanical Contractor in advance of installation to prevent space conflicts.
7. Connect recessed luminaires to branch circuitry by means of single flexible metal conduit 6'-0" in length.

B. Barriers

1. Required where recessed luminaires are installed in insulated ceilings.
2. Suitable material to satisfy NRTL requirements.
3. Provided by Division 26 when not indicated otherwise.
4. Coordinate installation.

C. Luminaire Supports

1. Provide adequate supports to any structures, ceilings and grid systems to safely suspend or attach luminaires.
2. General Contractor to provide ceiling support systems as required by that portion of the Specifications. Electrical Contractor to provide any additional supports on an "as needed" basis to prevent ceiling from sagging or developing other irregularities.
3. Contractor responsible for providing proper suspension and mounting devices and to safely support all luminaires shown on Drawings, regardless of ceiling systems.
4. Rigidly support surface suspended ceiling system with anchors, hangers or clips designed for the purpose.
5. Support surface-mounted luminaires at four-foot intervals.
6. Install recessed luminaires in accordance with manufacturer's recommendations.
7. Rigidly support recessed luminaires to structural members or properly supported ceiling system with hangers, clips or fasteners designed for the purpose.
8. Support pendant and stem-hung luminaires at four-foot intervals.

D. 0 – 10 Volt Dimming Control Circuits

1. Installed in accordance with NEC Article 725.
2. Class 1 systems
   a. #14 AWG THWN/THHN solid conductors installed in the same raceway as associated power wiring.
3. Class 2 systems
   a. #18/2 non-shielded cable unless otherwise indicated on the drawings.
   b. Plenum rated where required.
   c. Cable shall be installed in raceway when concealed within walls, in mechanical rooms, and rooms without ceilings.
      1) DO NOT INSTALL IN SAME RACEWAY AS POWER CIRCUITRY.
   d. Cable not required to be enclosed in raceway when installed above accessible ceilings.
      1) Route cables parallel or perpendicular to building construction.
      2) Support cables from building structure utilizing approved methods.
      3) Neatly coil excess cable length of pre-terminated assemblies.
      4) All cable runs shall be continuous between devices. NO SPLICING.

3.3 TESTS

A. Upon completion of this portion of the Work and prior to its acceptance by Owner, check for proper alignment and operation of all lighting equipment.

3.4 CLEAN UP

A. Clean all luminaires immediately prior to final inspection.

END OF SECTION

SECTION 266530 – ELECTRIC HEATING EQUIPMENT

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Furnish and install all electric heating equipment as scheduled on Drawings.

1.2 SUBMITTALS

A. Shop Drawings

1. Provide information in accordance with Section 260500.

B. Record Manuals

1. Provide information in accordance with Section 260500.

PART 2 – PRODUCTS

2.1 GENERAL

A. Size, wattage and control as scheduled.

PART 3 – EXECUTION

3.1 STORAGE

A. Store electric heating equipment in a cool, dry space prior to installation.

3.2 INSTALLATION

A. Install in accordance with Code, product listing, and manufacturer's recommendations.

B. Mount baseboard heaters above Architectural base.

END OF SECTION

SECTION 266540 – CONNECTIONS TO EQUIPMENT

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. The Contractor shall provide operational electrical connections to all electrically driven or controlled equipment.

PART 2 – PRODUCTS

2.1 MATERIALS

A. General

1. The Contractor shall provide all necessary materials and labor required to make final operational connections to all equipment, generally as shown on the Drawings, and specifically as required by equipment specifications and installation literature.
2. Control devices and panels furnished by others will be delivered to the contractor at the jobsite, and shall be installed in accordance with manufacturer's printed instructions. Review equipment specifications to determine extent of work involved.

PART 3 – EXECUTION

3.1 GENERAL

A. Provide operational connections for all equipment shown on the Drawings. Connections shall be in accordance with manufacturer's recommendations, and shall be left operating in a manner acceptable to the Engineer and Owner.

B. Provide available fault current calculations for equipment listed in Section 260500-1.4E based on actual installation criteria (conductor lengths, raceway types, etc.). Calculations shall incorporate the current limiting effects of fuses supplied with local disconnecting means. Include calculation information in Record Manuals.

C. For all exterior mechanical equipment, provide weatherproof GFCI receptacle outlet within 25' of equipment, circuited to nearest unswitched power. Refer to NEC 210.63 and 406.8.

D. For all mechanical equipment located in attic and crawl spaces, provide porcelain lamp holder with integral receptacle and lamp guard, circuited to nearest unswitched power via pilot handle toggle switch near access hatch. Engrave plate. Refer to NEC 210.70(C).

3.2 CLEANING

A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.

B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 270500 – DIVISION 27 GENERAL PROVISIONS

PART 1 – GENERAL

1.1 DESCRIPTION

A. The provisions and requirements of Section 260500 shall be applicable to Division 27.

B. All Division 27 work shall be included under the Division 26 contract.

C. The Contractor shall take special note that any conflicts between the Contractor and any Division 27 subcontractors shall not become an issue of the Engineer or Owner. It shall be the Contractor's responsibility to coordinate with the Division 27 subcontractor/s to determine where their work leaves off and where the subcontractor's work begins. The Contractor shall be responsible for all specified work including the operations of work under Division 27.

END OF SECTION

SECTION 270528 – NETWORK SYSTEMS ROUGH-IN

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide raceways for network systems as shown on the Drawings.

B. Work furnished and installed by others.

1. Local serving telephone utility shall place the service entrance cable to the point of presence, install circuit protection cabinet, protectors, and ground the entrance cable as needed to the service grounding conductor provided under this contract.

PART 2 – PRODUCTS

2.1 GENERAL

A. Main telephone terminal boards (TTB): ¾" grade AD fire-resistant plywood, painted gray (including edges). Dimensions as required by serving utility company.

B. Voice/data terminal board (TTB):

1. ¾" grade AD fire-resistant plywood, painted gray (including edges). Dimension as required by Owner's network system supplier. May be included with main telephone terminal board for single board installation.

C. Raceways:

1. As specified in Section 260533 and sized as shown on Drawings, minimum 1".

D. Boxes:

1. 2-1/8" deep unless restricted by wall thickness.
2. As specified in Section 260534 and 260540.

E. Blank plates:

1. As specified in Section 262726, yoke-mounted. Box-mounted plates not acceptable.

F. Firestop Assemblies

1. NRTL listed 4" square pathway with intumescent material designed to seal out fire, smoke, and toxic gases.
2. Quantity shall equal or exceed the width of the associated cable tray. i.e. a 6" wide tray requires two pathways.
3. Include mounting accessories as required by application specifics.
4. Manufacturer: EZ Path Series 44, 3M Model PT4SD or approved equal.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Serving Communications Utility Requirements

1. Raceways:
   a. Provide telephone service entrance conduit, stubbed to terminal board from property line.
   b. Verify service entrance conduit size and quantity, and property line location with serving utility.
   c. Provide bushing or connector at each conduit stub.
   d. Provide pull wire in each telephone conduit run.
2. Provide surface double-duplex receptacle at main telephone terminal board, fed from dedicated spare circuit breaker. Receptacles to be isolated ground type, with separate grounding conductor connected to panelboard grounding bar.
3. Provide telephone board communication grounding bus as required by serving utility, minimum #6 solid SDBC in conduit, extended shortest and most direct route to ground bar at main switch. Terminate in ground bar affixed to telephone terminal board, location as directed by serving utility.
4. Entire installation to comply with serving utility company requirements.

B. Raceways:

1. In areas without cable tray stub from rough-in location into nearest accessible ceiling space, or location as indicated on Drawings.
2. In areas WITH cable tray stub from rough-in location to within 6” of nearest cable tray, or location as indicated on drawings.
3. Provide bushing or connector at each conduit stub.
4. Provide pull wire in each voice/data raceway.
5. Provide raceway system where concealed in walls, in mechanical rooms and rooms without accessible ceilings.

C. Provide blank plates for all rough-in boxes not concealed by Owner’s voice/data equipment.

D. Entire installation to comply with Owner’s network systems supplier requirements.

END OF SECTION

SECTION 271500 – NETWORK CABLING

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide Network Cabling System as shown and described.

B. Work furnished and installed by others.

1. Voice: The Owner will provide all telephone handsets.
2. Data: The Owner will provide all end-user software, programming, computer servers, terminals and personal computers.
3. Surveillance: The surveillance system cameras, servers, switches and storage equipment will be provided and installed either by the Owner or under other Sections of this specification.

C. Description of System

1. Voice: Work shall include, but not be limited to, devices, faceplates, cables and cable assemblies, connecting blocks, cable management, terminations, and final acceptance testing.
2. Data: Work shall include, but not be limited to, devices, faceplates, cables and cable assemblies, cable management, patch panels, data racks, terminations, and testing.
3. Surveillance: Work shall include, but not be limited to, devices, cables and cable assemblies, cable management, patch panels, data racks, terminations, and testing.

1.2 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500.
2. Indicate:
   a. Mounting details.
   b. Connection diagrams.
   c. Description of devices.
   d. Name of installation Contractor/Subcontractor.

B. Record Manuals

1. Provide information in accordance with Section 260500.
2. Include manufacturer's data for adjustment, operation and maintenance of equipment and name of service organization.

PART 2 – PRODUCTS

2.1 MANUFACTURER/SUPPLIER

A. The system specified is based on equipment as manufactured by General Cable, Panduit, Commscope and other manufacturers as listed. All reference to model numbers and other pertinent information is intended to establish the standards of operational concepts, performance, quality and appearance which must be met. Backboards, conduit, cable tray, and rough-ins shall be by Electrical Contractor.

B. Contractors/Subcontractors performing Section 271500 work shall have personnel trained/certified in communications cabling installation via equipment manufacturers' or industry standards' training programs. Refer to Section 260500-1.5 Quality Assurance.

C. Acceptable installers:

1. Computer Store, 1100 S Broadway, Minot, ND 58701, 701/838-3967.
2. Dell-Comm, Inc. 812 S 18th St., Bismarck, ND 58504, 701/222-2887.
3. Gefroh Electric, 100 45th Ave NW, Minot, ND 58703, 701/838-0225.
4. Innova Integrated Systems, 1800 22nd Ave SW, Minot, ND, 701/837-0131.
5. Main Electric, 2626 Valley St., Minot, ND 58701, 701/852-3315.
6. Maycomm, 1711 12th Ave SW, Minot, ND 58701, 701/838-8401.
7. Muth Technology, 600 E Benson Rd, Sioux Falls, SD 57104, 800/888-1597.
8. RBB Electric, 1123 N 1st St., Grand Forks, ND 58208, 701/775-7404.
9. Wheeler Construction, 1720 South Broadway, Minot, ND, 58701, 701/852-5584.
10. Installers not listed above and wishing to quote shall refer to Specification 260500-1.4 for approval procedure. No consideration shall be given to any installer not pre-approved.

2.2 DEVICES AND FACEPLATES

A. Data jacks: Single outlet RJ45, eight-pin/eight wire, modular construction, TIA/EIA-568-B.2-1 Category 6 compliant, T568A and T568B identification, Panduit Mini-Com #CJ688TG, Commscope #MGS400 series, Leviton #61UJK series, or approved equal.

B. Voice jacks: Same as data jacks.

C. Voice wall-mount face plate/jack assembly: Stainless steel with Category 6 keystone jack, Panduit #KWP6, Commscope #630B8, Leviton #4108W1SP series, or approved equal.

D. Faceplates: Single gang with four sloped modular inserts. Panduit #CFPSL4 series, Commscope #M14AS, Leviton #42081 series, or approved equal.

E. Provide blank modules as required. Panduit #CMB, Commscope #M81, Leviton #41084 series, or approved equal.

F. Color: Devices as selected by Owner, faceplates as selected by Architect.

G. Surveillance Cameras

1. Jack assembly for cameras mounted to accessible ceilings shall utilize Panduit Model #CBXJ2IW-A enclosure mounted to building structure above the ceiling. Surveillance system provider shall be responsible for patchcord between camera and jack.

2. Cameras mounted directly to rough-ins or surface boxes shall utilize cable terminated to RJ45 Plug, Panduit Model #FP6X88MTG field terminating type or approved equal. Provide minimum 12" extra cable length within rough-in or camera mounting equipment.

2.3 CABLES AND CABLE ASSEMBLIES

A. Station cables (voice and data): Four unshielded, twisted pair, #23 gauge, Category 6 – 350 MHz, solid copper conductor, cable tray and plenum rated.

1. General Cable #7131900, Commscope #2088B, Berk-Tek #10032094 or equivalent meeting the following characteristics at 250 MHz.
   a. ACR: 10.5 dB min. @ 100m
   b. PS-ACR: 8.5 dB min. @ 100m
   c. ELFEXT: 24.5 dB min.
   d. PS-ELFEXT: 21.5 dB min.
   e. NEXT: 43 dB min.
   f. PS-NEXT: 41 dB min.
   g. ATTEN.: 32.8 dB max. @ 100m
   h. LCL: 26 dB min.
   i. Return Loss: 20 dB min.

2.4 WIRELESS ACCESS POINT (WAP) CABLING

A. Cabling for WAP's shall be Limited Power Listed CAT 6A.

1. Data jacks: Single outlet RJ45, eight-pin/eight wire, modular construction, TIA/EIA-568-C.2 Category 6A compliant, T568A and T568B identification, Panduit Mini-Com #CJ6X88TG, or approved equal.
2. Above Ceiling Installation: Panduit #CBXQ2IW-A, or Approved Equal surface termination box attached to building structure.
3. Station cables: Four unshielded, twisted pair, #23 gauge, Category 6A – 500 MHz, solid copper conductor, cable tray and plenum rated. UL Listed CMP-LP (0.6A) to support up to 120 watts.
   a. General Cable #7141820 or Approved Equal meeting the following characteristics per 100 meters at 500 MHz.

      1) ACRF: 13.8 dB min.
      2) PSACRF: 10.8 dB min.
      3) PSAACRF: 26.2 dB min.
      4) NEXT: 33.8 dB min.
      5) PSNEXT: 31.8 dB min.
      6) PSANEXT: 54.0 dB min.
      7) Return Loss: 15.2 dB min.

2.5 MISCELLANEOUS PRODUCTS

A. Cable management:

1. 6" die-cast aluminum distribution rings: Allen Tel #GB13C or equivalent.
2. Plenum velcro cable ties: Panduit #HLSP series or equivalent.
3. Cable hooks with retainers: B-Line #BCH series or equivalent.

B. Patch Panels

1. Patch panels shall have modular jack-style termination connectors, be 24-port or 48-port in size, one or two standard EIA rack spaces in height. The panels shall have separate port and panel designation strips. Panduit #CP24BL or #CP48BL, Commscope #M2400-1U-GS, Leviton #49255-H24 or #49255-H48, or approved equal.
2. Quantity: As required by station cable count.

C. Data Rack (DTR1)

1. 84", floor-mounted, EIA/TIA 19" rack assembly. Panduit #R2P, Hoffman #EDR19FM45U, Chatsworth #55053-X03, or equivalent, quantity as shown on Drawings.
2. Provide horizontal cable management panels with integral bend radius control for front and rear cables. Size and quantity determined by cable and patch panel quantity. Panduit #NCMH2, Hoffman #DCHD2, Chatsworth #13930-702, or equivalent.
3. Provide full height 4"x5" vertical cable management panels for front and rear cables. Panels required on both sides of rack. Panduit #WMPV45E, Hoffman #DV6D7, Chatsworth #13915-703, or equivalent.
4. Provide two vertical rack mounted power distribution unit with NEMA L5-30P input plug and 24 NEMA 5-20R on the output per rack. Schneider Electric Model# AP7532 or equivalent.

D. Data Server Rack (DSR 1 & 2)

1. 86", floor-mounted, EIA/TIA 19" rack assembly. 40" depth with perforated lockable front and split perforated rear doors. Panduit Net-Verse D-Type Cabinet or equivalent.
2. Provide horizontal cable management panels with integral bend radius control for front and rear cables. Size and quantity determined by cable and patch panel quantity. Panduit #NCMH2, Hoffman #DCHD2, Chatsworth #13930-702, or equivalent.
3. Provide two vertical rack mounted power distribution unit with NEMA L5-30P input plug and 24 NEMA 5-20R on the output per rack. Schneider Electric Model# AP7532 or equivalent.

E. Radio Room Server Rack (RSR 1, 2, 3, & 4)

1. 86", floor-mounted, EIA/TIA 19" rack assembly. 40" depth with perforated lockable front and lockable split perforated rear doors. Panduit Net-Verse D-Type Cabinet or equivalent.
2. Provide horizontal cable management panels with integral bend radius control for front and rear cables. Size and quantity determined by cable and patch panel quantity. Panduit #NCMH2, Hoffman #DCHD2, Chatsworth #13930-702, or equivalent.
3. Provide two UL listed horizontal copper grounding bars set up for double lug connections. B-line Model# SBHB119K or approved equal.
4. Provide two vertical rack mounted power distribution unit with NEMA L5-30P input plug and 24 NEMA 5-20R on the output per rack. Schneider Electric Model# AP7532 or equivalent.

F. Identification:

1. Panduit #LS8E or Pan-Mark labeling systems or equivalent. Hand lettering not acceptable.

2.6 COLOR

A. All cables shall match their associated jack color for type of system served unless otherwise indicated.

B. Verify cable and jack color configuration with Engineer/Owner's Rep.

C. Typical color configuration.

1. Voice Jacks – Match Faceplate (Yellow cable)
2. Data Jacks – Yellow
3. WAP – Orange
4. Cameras – Purple

D. PSAP/Dispatch color configuration.

1. City IT –Yellow
2. SRT – Blue
3. Motorola & SIRN – Red
4. VESTA/Recorder – Green
5. CAD – Pink

PART 3 – EXECUTION

3.1 STORAGE

A. Store system equipment in cool, dry space prior to installation.

3.2 GENERAL

A. Securely install components where shown on Drawings.

B. Contractor shall adjust and provide all other assistance required at final inspection to bring the system satisfactorily on-line.

C. Install in accordance with NEC, EIA/TIA Standards, NRTL listing, and manufacturer's recommendations and instructions.

D. Cable:

1. Install cables in raceways as required by Section 270528 and in cable tray (communications type) where cable tray is specified.
2. Route open air cables (where not in raceway or cable tray) parallel or perpendicular to building construction supporting with specified products, maximum 4'-0” on center.
3. Bundle multiple open air cable runs located in TTB/TB rooms together with velcro cable ties
4. Identify ends of cables with room designations as directed by Owner.
5. Bending radius shall be minimum 1".
6. All cable runs shall be continuous, **NO SPLICING**.

3.3 DATA

A. Provide Data Rack(s) as shown and specified.

B. Install patch panels and cable management system in Data Rack.

C. Install data station cable from patch panel to data outlet locations as shown on the Drawings. Cable length not to exceed 295 feet.

D. Terminate cables according to T568A or T568B wiring scheme as determined by Owner’s system requirements.

E. Identify cable at both ends according to Owner's convention. Arrange patch panels and patch panel jacks as per Owner's convention. Identify all patch panels, patch panel jacks, and faceplate jacks according to Owner's convention.

1. If no convention is available, room numbers shall be incorporated into the identification. Ex: For room 120, use 120-1 for first cable, 120-2 for second cable, etc.

3.4 SURVEILLANCE

A. Install separate dedicated patch panels in Data Rack for the camera cables.

B. Install station cable from patch panel to camera locations as shown on the Drawings. Cable length not to exceed 295 feet. Verify exact camera location and mounting configuration with Surveillance System installer.

C. Terminate cables according to T568A or T568B wiring scheme as determined by Owner's system requirements.

D. Identify cable at both ends according to Owner's convention. Arrange patch panels and patch panel jacks as per Owner's convention. Identify all patch panels, patch panel jacks, and faceplate jacks according to Owner's convention.

1. If no convention is available, camera numbers shall be incorporated into the identification. Ex: For camera 21, use C-21.

3.5 GROUNDING

A. See detail 1/E104 for grounding and bonding requirements in rooms 103 & 104.

B. For the racks in Rooms 133 and 149 provide the following:

1. For each data rack, provide one #10 AWG solid copper conductor from data rack to nearest panelboard with equipment ground bus.

2. Where multiple data racks are located in single room (more than 2), provide isolated communication grounding bus in room. Extend #6 solid SDBC in conduit, extended shortest and most direct route to ground bar at nearest panelboard with equipment ground bus. Extend one #10 AWG solid copper conductor from each data rack to communication grounding bus in room.

3.6 TESTING REQUIREMENTS

A. All terminated voice and data cables shall be tested and certified for TIA/EIA-568-B.2-1 Category 6 standards. The test shall be performed on the permanent link configuration (from station jack to patch panel jack). These standards require the following when tested at 250 MHz:

1. Near End Cross Talk (NEXT) shall be no less than 35.3dB.
2. Power Sum Near End Cross Talk (PSNEXT) shall be no less than 32.7dB.
3. Equal Level Far End Cross Talk (ELFEXT) shall be no less than 16.2dB.
4. Power Sum Equal Level Far End Cross Talk (PSELFEXT) shall be no less than 13.2 dB.
5. Return Loss shall be no less than 10.0dB.
6. Propagation Delay shall be less than 498 nanoseconds when measured at 10 MHz.
7. Propagation Delay Skew shall be less than 44 nanoseconds when measured at 10 MHz.
8. Insertion Loss (Attenuation) shall not exceed 31.1dB.

B. Additional testing shall include line mapping and cable length before final acceptance by Owner.

C. All permanent link cable runs shall be documented with a hard copy print-out of the test results. Compile one copy of test results in a loose-leaf binder, similar to manual references in Section 260500, 1.04E. Submit at project completion with referenced Record Manual.

D. Field tester to be Level III and conform to TIA/EIA 568-B.2-1 Annex A & B requirements.

3.7 CLEANING

A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.

B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 271510 – FIBER OPTIC CABLING

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide Fiber Optic Cabling System as shown and described.

B. Work furnished and installed by others.

1. The Owner will provide all end-user software, programming, computer servers, hubs/switches, media converters, and personal computers.

C. Description of System

1. Fiber optic work shall include but not be limited to raceway installation, pulling of fiber optic cable, splicing and terminating of cable assemblies and final acceptance testing.

1.2 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500.

B. Record Manuals

1. Provide information in accordance with Section 260500.

C. Record Drawings

1. Indicate exact locations of junction boxes containing cable for future connection.

PART 2 – PRODUCTS

2.1 MANUFACTURER/SUPPLIER

A. All reference to model numbers and other pertinent information is intended to establish the standards of operational concepts, performance, quality, and appearance that must be met.

B. Acceptable installers/suppliers:

1. Refer to Specification Section 271500, 2.1B.

2.2 FIBER OPTIC RACEWAY

A. Corrugated, non-metallic, flexible raceway for use in plenum and non-plenum applications.

B. Size as required or as indicated on Drawings.

C. Provide associated fittings as required.

D. Manufacturer: Carlon Plenum-Guard series or equivalent.

2.3 FIBER OPTIC CABLE

A. Armored Multimode Cable

1. OFCP rated
2. 900 μm tight buffer twelve-fiber distribution style.
3. 50/125 μm diameter.
4. OM3 10Gb/s @ 850 nm for distances up to 300 meters.
5. Manufacturer: General Cable # BE0121PNU-ILPA or approved equal

2.4 MISCELLANEOUS PRODUCTS

A. Connectors

1. LC style connectors as required by owners equipment.
2. Factory polished. **FIELD POLISHED CONNECTORS NOT ACCEPTABLE.**
   a. Factory polished pigtails terminated to the distribution cable by either fusion splicing or mechanical splicing with gradient matching gel (Panduit Opti-Cam or equivalent).
   b. Factory polished connector with mechanical termination directly to the distribution cable utilizing gradient matching gel (Panduit Opti-Cam or equivalent).
   c. Pre-terminated cassette with pre-terminated MTP type fiber connector on the distribution cable.

B. Patch Panel

1. Standard 19” rack mounting tray with removable top cover. Integral slack storage spools.
   a. Fiber Adapter Panels as required if utilizing pigtail connectors or Opti-Cam connectors.
   b. Cassettes as required if utilizing MTP type system.
2. Manufacturer: Panduit FMT2 with CFAPPBL2 or approved equal assembly.

C. Identification:

1. Panduit # LS5 or Pan Mark labeling systems, or equivalent. Hand lettering not acceptable.

PART 3 – EXECUTION

3.1 STORAGE

A. Store fiber optic cable in cool, dry space prior to installation.

3.2 GENERAL

A. Install in accordance with NEC, EIA/TIA Standards, product listing, and manufacturer's recommendations and instructions.

B. Cable

1. Route cables parallel or perpendicular to building construction.

2. Cable to be enclosed in raceway as described in Section 2.02 of this Specification unless otherwise indicated on Drawings.
3. Identify ends of cables as directed by Owner/Engineer.
4. Bending radius as per cable specifications.
5. All cable runs shall be continuous between termination points; NO SPLICING.

3.3 TESTING REQUIREMENTS

A. All fiber optic strands shall be tested and certified for EIA/TIA 568 standards. These standards require the following:

1. Attenuation loss not to exceed 3.0 dB/km @ 850 nm for 50/125 multimode cables and 0.65 dB/km @ 1310 nm for 9/125 single mode cables.
2. 0.75 dB per mated pair of connectors.
3. 0.30 dB per splice.

B. Using a light source/power meter, test each fiber for overall attenuation loss. Submit meter readings for each fiber with Record Manuals.

C. Electrical Contractor responsible for cost to replace all unsatisfactory cables due to breaks, fractures, and bad splices as determined by testing.

3.4 CLEANING

A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.

B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 274133 – TV SIGNAL CABLING

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide TV Signal Cabling System as shown on Drawings.

B. Work Furnished and Installed by Others

1. Building service entrance cable to the TV termination point not in contract.

C. Description of System

1. The system shall have the capability to distribute signals supplied by the local cable company. Each TV outlet will require a separate feed from the TV distribution point(s).

1.2 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500.
2. Indicate mounting details, connection diagrams and description of system functions.

B. Record Manuals

1. Submit information in accordance with Section 260500.
2. Include manufacturer's data for adjustment, operation and maintenance of equipment and name of service organization.
3. Provide multiple copies, one to remain in central cabinet, other copies for Record Manuals.

PART 2 – PRODUCTS

2.1 MANUFACTURER/SUPPLIER

A. The system specified is based on equipment as manufactured by Blonder Tongue and other manufacturers as listed. All reference to model numbers and other pertinent information is intended to establish the standards of operational concepts, performance, quality and appearance which must be met.

B. Acceptable Suppliers:

1. Computer Store, 1100 S Broadway, Minot, ND 58701, 701/838-3967.
2. Data Connections, 4016 37th Avenue NW, Mandan, ND (701) 426-8771.
3. Dell-Comm, Inc., 812 South 18th Street, Bismarck, ND (701) 222-2887.
4. Kohler Communications Inc., 1429 Main South, Dickinson, ND (701) 225-5554.
5. Tricorne Audio, 4023 State Street, Bismarck, ND (701) 258-6912.

2.2 SPLITTERS

A. Radiation shielded with one input and outputs as required.

B. Meet CATV and SMATV requirements for RF shielding.

C. 5 MHz to 2.4 GHz frequency range.

D. Connections to use F type shielded hex crimped connectors.

E. All ports have power-pass.

F. Manufacturer: Blonder Tongue LPD series or equivalent.

2.3 OUTLETS

A. TV Jacks: F-type connector supplied with 75 ohm self-terminating F-type coupler for SUB/VHF/CATV/UHF. Manufacturer: Panduit Mini-Com #CMFSR Series.

B. Faceplates: Single gang, vertical faceplate accepting modular jack(s). Manufacturer: Panduit #CFP Series plates. Color as selected by Architect.

C. Where TV and voice/data outlets are shown ganged together on the Drawings, device plates furnished under Section 271500.

2.4 CABLE

A. Cable

1. RG-6
    a. #18 AWG .040 copper.
    b. 100% foil/60% aluminum braid/100% foil/40% aluminum braid.
    c. Type RG-6 Quad Shield Coax.
    d. Plenum-rated where installed above accessible ceilings and not in raceway.
    e. Manufacturer: Belden #5339Q5 or #6339Q8 (plenum-rated), or equivalent.
2. RG-11
    a. #14 AWG copper solid copper.
    b. 100% foil/60% aluminum braid/100%foil/40% aluminum braid.
    c. Type RG-11 Quad Shield Coax.
    d. Plenum-rated where installed above accessible ceilings and not in raceway.
    e. Manufacturer: Belden #70084NH-series or equivalent.

B. Cable Management:

1. Six inch die-cast aluminum distribution rings: Manufacturer: Allen Tel #GB13C or equivalent.
2. Velcro cable-ties: Manufacturer: Panduit HLX series or equivalent.
3. Bridle rings: Manufacturer: B-Line BR series or equivalent.

PART 3 – EXECUTION

3.1 STORAGE

A. Store TV signal cabling components in a cool, dry space prior to installation.

3.2 INSTALLATION

A. Install in accordance with Code, product listing, and manufacturer's recommendations.

B. Contractor shall adjust and provide all other assistance required at final inspection to bring the system satisfactorily on-line.

C. Cable

1. Route cables parallel or perpendicular to building construction.
2. Support cables with bridle rings, maximum 6'-0” on center.
3. Bundle multiple cable runs together with velcro cable ties, maximum 3’-0” on center.
4. Identify ends of cables with room designations as directed by Owner.
5. Minimum one inch bending radius.
6. All cable runs shall be continuous, NO SPLICING.

D. Conduit

1. Provide minimum 3/4" conduit, where cable is concealed within new walls, in mechanical rooms and rooms without ceilings.
2. Cable not required to be enclosed in conduit where installed:
   a. In existing walls.
   b. Above existing plaster ceilings.
   c. Above accessible ceilings.

E. Provide F-type, shielded, hex-crimped connectors at all cable ends.

F. Provide splitters where indicated.

G. Outlets shall be properly shielded to eliminate any leakage of signal. Tap values shall be designed so that signal levels can be kept at no more than +5 dB on Channel 41 @ 300 MHz.

H. Exercise particular care for installation of control rough-in boxes to ensure plumb and level placement.

I. Entire installation to comply with Owner's cable requirements.

3.3 TESTS

A. Prior to final inspection, verify that the system is installed in accordance with serving utility standards, and in proper working condition. Furnish letter of verification to Engineer indicating that the system has been tested by a manufacturer's representative. List date of test and name of manufacturer's representative.

3.4 CLEANING

A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.

B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 275110 – MEETING ROOM MULTI-MEDIA SYSTEM

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide complete and operational multimedia reinforcement system for the Meeting Room as shown on Drawings.

B. Work furnished and installed by others

1. The Owner will provide PoE network equipment and internet service.

C. Description of System

1. The system shall provide A/V presentation through the provided TV via wired HDMI and wireless program sources.
2. The system shall support virtual meetings via the provided webcam and networked small form factor Mini PC (NUC).

1.2 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500.
2. Indicate mounting details, cabinet dimensions, connection diagrams, and description of system functions.

B. Record Manuals

1. Submit information in accordance with Section 260500.
2. Include manufacturer's data for adjustment, operation and maintenance of equipment and name of service organization.

PART 2 – PRODUCTS

2.1 MANUFACTURER/SUPPLIER

A. The system specified is based on equipment as manufactured Extron and other manufacturers as listed.

B. All references to model numbers and other pertinent information is intended to establish the standards of operational concepts, performance, quality and appearance which must be met.

C. Acceptable suppliers:

1. The Computer Store, 1100 S Broadway, Minot, North Dakota, (701) 838-3967.
2. TriCorne Audio Inc, 4023 State Street, Bismarck, North Dakota, (701) 258-6912.

2.2 SMART TV

A. 65” Class LED TV
B. 4K UHD
C. Minimum 120 Hz or faster refresh rate.
D. Smart Capable with Integral LAN port.
E. HDMI inputs as required.
F. Quantity as shown on drawing details.
    1. Rooms with two TV’s shown, provide HDMI Splitters from the NUC and Presentation Gateway outputs to both TV’s for source selection via TV remote controls.
G. Manufacturers: LG, Samsung, Sharp, or Sony.

2.3 VIRTUAL MEETING EQUIPMENT

A. NUC.

    1. Intel Core i5 Processor with minimum operating speed of 4GHz.
    2. Integral SSD hard drive (250 GB minimum)
    3. 8 GB Memory minimum.
    4. I/O: Ethernet port, HDMI, USB-C.
    5. Windows, Latest Version, 64 bit operating system.
    6. Wireless Keyboard and Mouse with high output USB dongle.

B. Webcam.

    1. HD camera with motorized pan/tilt/zoom.
    2. Integral full range speakers.
    3. Integral microphone array.
    4. USB plug and play, compatible with Windows version provided on NUC.
    5. Manufacturer: Logitec #960-001101; or approved equal.

2.4 PRESENTATION EQUIPMENT

A. Presentation Gateway.

    1. Allows screen sharing/mirroring from mobile and portable devices via the facility wireless network.
    2. Allows screen sharing/mirroring from hard wired portable devices via HDMI.
    3. 4K output.
    4. PoE.
    5. Manufacturer: Extron #Sharelink Pro 1100.

B. Tabletop Interface.

    1. Flip-top style flush mount box for power and A/V connections with cable pass through cover.
    2. Cable Cubby Modules:
        a. One retractable HDMI.
        b. One retractable White Cat 6 RJ45 (telco)
        c. One retractable Blue Cat 6 RJ45 (data).
        d. One Duplex receptacle with USB A and C power.
    3. Manufacturer: Extron #CableCubby 500 or approved equal.

2.5 MISC.

A. Provide wall mounting brackets for all equipment as required for complete system installation. Ensure TV bracket provides proper clearance for the other equipment.

B. Provide all HDMI, USB, CAT6, and AUDIO patch cords as required for complete system.

PART 3 – EXECUTION

3.1 STORAGE

A. Store public address components in a cool, dry space prior to installation.

3.2 INSTALLATION

A. General

1. Verify exact mounting height/position of TV with Owner prior to installation.
2. Install NUC and Presentation Gateway concealed behind the TV.
   a. Carefully support all cables to ensure they are properly concealed behind the TV.
   b. Route Tabletop HDMI through the Presentation Gateway (not connected directly to a TV input).
3. Verify exact mounting location of the Tabletop Interface with Owner prior to installation in meeting room table (provided by others).
4. Obtain required IP addresses for TV, NUC, and Gateway from Owner and perform complete setup of each device.

3.3 TESTS

A. Prior to final inspection, verify that the multimedia system is in proper working condition. Furnish letter of verification to Engineer indicating that the system has been tested by a manufacturer's representative. List date of test and name of manufacturer's representative. Division 26 contractor responsible for test and scheduling.

3.4 INSTRUCTIONS

A. Manufacturer's representative shall instruct Owner in proper operation, maintenance and testing of the complete system. Indicate on letter of verification, name of Owner's representative receiving instructions.

B. Record instructions and include with Record Manuals in accordance with Section 260500.

3.5 CLEANING

A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.

B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 275111 – LARGE MEETING ROOM MULTI-MEDIA SYSTEMS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide complete and operational multimedia reinforcement system for the Large Meeting Room as shown on Drawings. The system shall also support video distribution via a matrix switcher with selectable inputs and outputs. The system shall be controlled by a digital signal processor and a scaling video processor operated by touchscreen controllers with custom graphics.

B. Description of System

1. The system shall provide A/V presentation through the provided TV's via wired HDMI and wireless program sources.
2. The system shall support virtual meetings via the provided webcam and networked small form factor Mini PC (NUC).
3. The system shall provide selectable 4K video distribution for multiple inputs and multiple outputs via a matrix switcher. Inputs include:
   a. NUC.
   b. Presentation Gateway.
   c. Midcontinent Cable.
   d. Floorbox HDMI.
4. The system shall also provide audio reinforcement of selected program sources (multimedia sources).

1.2 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500.
2. Indicate mounting details, cabinet dimensions, connection diagrams, and description of system functions. Include the layout and operational description of the touch screen controllers, which shall indicate all device icons and operations.

B. Record Manuals

1. Submit information in accordance with Section 260500.
2. Include manufacturer's data for adjustment, operation and maintenance of equipment and name of service organization.

PART 2 – PRODUCTS

2.1 MANUFACTURER/SUPPLIER

A. The system specified is based on equipment as manufactured Extron and other manufacturers as listed.

B. All references to model numbers and other pertinent information is intended to establish the standards of operational concepts, performance, quality and appearance which must be met.

C. Acceptable suppliers:

1. The Computer Store, 1100 S Broadway, Minot, North Dakota, (701) 838-3967.
2. TriCorne Audio Inc, 4023 State Street, Bismarck, North Dakota, (701) 258-6912.

2.2 SMART TV

A. 65” Class LED TV
B. 4K UHD
C. Minimum 120 Hz or faster refresh rate.
D. Smart Capable with Integral LAN port.
E. HDMI inputs as required.
F. RS-232 control compatible.
G. Quantity as shown on drawing details.
H. Manufacturers: LG, Samsung, Sharp, or Sony.

2.3 HEAD END EQUIPMENT (LCCP)

A. VIDEO PROCESSOR

1. Digital multi-channel audio-follow-video matrix switch.
2. HDMI and DTP type with 4K scaling.
3. 8 x 4 In/Out configuration with DTP 4K Twisted Pair and HDMI ports.
4. Integral 100 Watt 70V amplifier.
5. Manufacturer: Extron #DTP Crosspoint 84 4K series.

B. PRESENTATION GATEWAY (ONE THUS)

1. Allows screen sharing/mirroring from mobile and portable devices via the facility wireless network.
2. 4K output.
3. Manufacturer: Extron #Sharelink Pro 1100

C. CABLE TV

1. Decoder supplied by Owner
2. Provide IR emitter kit for operation from CATV remote control. Verify exact location with engineer.
   a. Manufacturer: Extron or equivalent.

D. PoE SWITCH

1. Provide PoE switch for control system power and networking.
2. Extend cabling between all control equipment as necessary.
3. Manufacturer: TrendNet, Cisco, HP or equivalent

E. Enclosure

1. Pull out and turn/swing rack. Size as required to fit within the cabinetry.
2. 19’’ deep and RU count as required for equipment.

3. Include surge suppression type power strip as required for equipment.
4. Manufacturer: Lowell #LPTR2 series.

2.4 VIRTUAL MEETING EQUIPMENT

A. NUC.

1. Intel Core i5 Processor with minimum operating speed of 4GHz.
2. Integral SSD hard drive (250 GB minimum)
3. 8 GB Memory minimum.
4. I/O: Ethernet port, HDMI, USB-C.
5. Windows, Latest Version, 64 bit operating system.
6. Wireless Keyboard and Mouse with high output USB dongle.

B. Media Port

1. HDMI to USB bridge for combining camera and mic sources for bi-directional input to the NUC.
2. Scaling video with aspect ratio control.
3. Manufacturer: Extron #MediaPort 200.

C. IP Broadcast Camera.

1. Full 1920x1080p HD Resolution with H.264 and H.265 streaming at 60 fps.
2. RS232 based PTZ control.
3. Capable of simultaneous HDMI and IP Streaming.
4. 20x zoom lens.
5. PoE.
6. Include wall mount bracket.
7. Manufacturer: PTZOPTICS Model #PT20X-SDI-GY-G2.

D. Ambient Mic (M5 Designation)

1. 8 zone steerable array ambient system in 2’ x 2’ enclosure designed for ACT ceiling grids.
2. Dante Protocol.
3. PoE.
4. Manufacturer: Shure #MXA910W-US
   a. Include Shure #ANIUSB-MATRIX audio processor installed in the Head End cabinet to control the mic and provide output to the Media Port.
   b. Install the processor Software on the NUC.

2.5 MULTIMEDIA INPUT STATION (XID)

A. Converts 4K HDMI with embedded audio input to HDBaseT for transmission to video processor.
B. Includes 3.5mm audio input.
C. 230 Foot cable distance.
D. Single-gang decora style device.
E. Manufacturer: Extron #DTP T HWP 4K 231 D

2.6 MULTIMEDIA OUTPUT STATION (XOD)

A. Converts DTP to scalable 4K HDMI for connection to council table monitors.
B. Includes RS-232 control signals.
C. 230 Foot cable distance.

D. Single-gang decora style device.
E. Manufacturer: Extron #DTP R HWP 4K 231 D

2.7 TABLETOP INTERFACE WITH TOUCHSCREEN CONTROLLER

A. 7'' programmable touchscreen mounted to cover of table cubby. Screen shall have multiple menus for the various room setup functions plus individual audio or video selection and control options.
B. PoE powered.
C. Cable Cubby Modules:
   1. One retractable HDMI
   2. One retractable White Cat 6 RJ45 (telco)
   3. One retractable Blue Cat 6 RJ45 (data).
   4. One Duplex receptacle with USB A and C power.
D. Extron Model# TLP Pro 725C.

2.8 SPEAKERS

A. Type D.

   1. 6.5" 2-way coaxial ceiling mount with wide distribution.
   2. 80Hz – 20kHz frequency response.
   3. 60W continuous power with tapped transformer.
   4. Mounting hardware/accessories as required.
   5. Manufacturer: Biamp Community #D6 Series

2.9 MISC.

A. Provide wall mounting brackets for all equipment as required for complete system installation. Ensure TV bracket provides proper clearance for the other equipment.

B. Provide all HDMI, USB, CAT6, and AUDIO patch cords as required for complete system.

PART 3 – EXECUTION

3.1 STORAGE

A. Store public address components in a cool, dry space prior to installation.

3.2 INSTALLATION

A. General

   1. Verify exact mounting height/position of TV with Owner prior to installation.
   2. Install NUC and Presentation Gateway concealed behind the TV.
      a. Carefully support all cables to ensure they are properly concealed behind the TV.
      b. Route Tabletop HDMI through the Presentation Gateway (not connected directly to a TV input).
   3. Verify exact mounting location of the Tabletop Interface with Owner prior to installation in meeting room table (provided by others).
   4. Obtain required IP addresses for TV, NUC, and Gateway from Owner and perform complete setup of each device.

3.3 TESTS

A. Prior to final inspection, verify that the multimedia system is in proper working condition. Furnish letter of verification to Engineer indicating that the system has been tested by a manufacturer's representative. List date of test and name of manufacturer's representative. Division 26 contractor responsible for test and scheduling.

3.4 INSTRUCTIONS

A. Manufacturer's representative shall instruct Owner in proper operation, maintenance and testing of the complete system. Indicate on letter of verification, name of Owner's representative receiving instructions.

B. Instruction period shall be for a period of 2 hours unless otherwise acceptable to Owner.

C. Record instructions and include with Record Manuals in accordance with Section 260500.

3.5 CLEANING

A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.

B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 275117 – COUNCIL CHAMBER MULTI-MEDIA SYSTEM

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Provide a complete and operational Multi-Media System to support voice and audio program sources for Council Chamber. The system shall also support video distribution via a matrix switcher with selectable inputs and outputs. The system shall be controlled by a digital signal processor and a scaling video processor operated by touchscreen controllers with custom graphics.

B. Description of System

1. The system shall provide individually controlled voice reinforcement from all council seats and presenter locations. It shall also provide audio reinforcement of selected program sources (multimedia sources).

2. The system shall provide selectable 4K video distribution for multiple inputs and multiple outputs via a matrix switcher. The video monitors on the Council Table shall all display the same system output via a distribution amplifier. All other outputs shall be individually selectable from available input sources.

3. The system shall provide screen sharing/mirroring from mobile and portable devices.

4. The system shall include multiple PTZ cameras utilized for simultaneous live streaming and recording of meetings. The system shall also interface with Midcontinent Cable as required to allow events to be broadcast on the local public access channel. The system shall also be able to display local program sources.

5. The system shall also provide audio/video to the adjacent lobby if so selected.

6. The system shall be controlled via touchscreen controllers in the PR Directors office. A simple “Preset” remote station shall be included in the Chamber for simple system operation if the PR Director is not present.

1.2 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500.
2. Indicate mounting details, cabinet dimensions, connection diagrams, and description of system functions. Include the layout and operational description of the touch screen controllers, which shall indicate all device icons and operations.

B. Record Manuals

1. Submit information in accordance with Section 260500.

2. Include manufacturer's data for adjustment, operation and maintenance of equipment and name of service organization.
3. Provide multiple copies, one to remain in equipment cabinet, other copies for Record Manuals.

PART 2 – PRODUCTS

2.1 MANUFACTURER/SUPPLIER

A. The system specified is based on equipment as manufactured by Extron, BiAmp and and other manufacturers listed.

B. All references to model numbers and other pertinent information is intended to establish the standards of operational concepts, performance, quality and appearance which must be met.

C. Acceptable Suppliers:

1. The Computer Store, 1100 S Broadway, Minot, North Dakota, (701) 838-3967
2. TriCorne Audio Inc, 4023 State Street, Bismarck, North Dakota, (701) 258-6912.

2.2 HEAD END EQUIPMENT (MMCP)

A. VIDEO PROCESSOR

1. Digital multi-channel audio-follow-video matrix switch with independent stereo matrix for audio breakaway
2. HDMI and XTP type with 4K scaling.
3. XTP 4K Twisted Pair type I/O boards as required from specific installation.
4. Manufacturer: Extron #XTP II Crosspoint 3200 series (32x32 Frame).

B. VIDEO DISTRIBUTION AMPLIFIERS (REQUIRED FOR NINE CHAMBER TABLE MONITORS)

1. Digital 4K HDBase-T splitter/amplifier for transmitting up to 230ft.
2. 4 or 8 DTP outputs as required.
3. HDMI Input with loop through.
4. Manufacturer: Extron #DTP HD DA 4K 230 Series.

C. AUDIO PROCESSORS

1. Open architecture style Digital Signal Processor with phantom power per channel.
2. Frequency response 20Hz-20kHz.
3. Configuration/Control TouchLink and Ethernet.
4. 12 x 8 In/Out configuration.
5. Manufacturer: Biamp #TesiraFORTE Series.

D. POWER AMPLIFIER (ONE THUS)

1. Independent channel type.
2. Frequency response: 20Hz to 20kHz.
3. Standard 19” rack-mount type.
4. Quantity, power output and channel configuration as required for specific installation.
5. Manufacturer: Community Model ALC Series.

E. PRESENTATION GATEWAY (ONE THUS)

1. Allows screen sharing/mirroring from mobile and portable devices via the facility wireless network.
2. 4K output.
3. Manufacturer: Extron #Sharelink Pro 1100.

F. PUBLIC ACCESS CHANNEL

1. Public access channel transmission equipment supplied by Owner.
2. Install equipment in head end enclosure and interface with video processor as required.

G. MMCP CONTROLLERS (TWO THUS)

1. 15” Touch-screen interface module with custom graphics tailored to specific project.
2. Tabletop Mount.
3. PoE connection to processor.
4. Both controllers shall include all control pages, however typical event operation will have one controller for matrix operation and one controller for microphone operation (include digital “mute” buttons).
5. Manufacturer: Extron #TLP Pro 1525MG.

H. REMOTE CONTROLLER (ONE THUS)

1. 7” Touch-screen interface module with custom graphics tailored to specific project.
2. Recessed wall mount kit.
3. PoE connection to processors.
4. Manufacturer: Extron #TLP Pro 725M

I. PoE SWITCH

1. Provide PoE switch for control system power and networking.
2. Extend cabling between all control equipment as necessary.
3. Manufacturer: TrendNet, Cisco, HP or equivalent

J. ENCLOSURE

1. Swing out type rack with fixed base and back.
2. Wall mount full height 19” 44U x 28” Depth.
3. Power ventilation top.
4. Include Surge Suppression type power strips as required.
5. Manufacturer: Lowell LWBR -4428 or approved equal.

2.3 SPEAKERS

A. Type A.

1. 6.5” 2-way coaxial pendant hung speaker with wide distribution.
2. 65Hz – 20kHz frequency response.
3. 60W continuous power with tapped transformer.
4. Mounting hardware/accessories as required.
5. Manufacturer: Biamp Community #DP6 Series.

B. Type B

1. 6.5” 2-way coaxial pendant hung low profile speaker.
2. 75Hz – 18.5 kHz frequency response.
3. 60W continuous power with tapped transformer.
4. Mounting hardware/accessories as required.
5. Manufacturer: Biamp Desono #P6-SM Series.

C. Type C

1. 3” surface mount speaker with swivel bracket.
2. 115Hz – 20 kHz frequency response.
3. 10W continuous power with tapped transformer.
4. Manufacturer: Biamp Desono #KUB03T Series.

2.4 MICROPHONE INPUT JACK (M)

A. M1 Designation
1. Three-contact female XLR microphone jack.
2. Shock mount for direct connection to Gooseneck microphone.

B. M2 Designation
1. Two three-contact female XLR microphone jacks on single gang decora device body.
2. Single-gang faceplate.

C. M3 Designation
1. One four-contact female XLR jack for announcer’s headset.
2. Single-gang faceplate.

D. M4 Designation
1. Ambient type pendant mounted.
2. PoE transmitter.
3. Master/Slave connectivity up to three microphones.
4. Manufacturer: BiAmp Parle #TCM-1 series.

2.5 AUDIO OUTPUT JACK (AO)

A. Two three-contact male XLR microphone jacks on single gang decora device body.
B. Faceplate labeled “MEDIA FEED”.

2.6 MULTIMEDIA INPUT STATION (XIX)

A. Converts 4K HDMI with embedded audio input to HDBaseT for transmission to video processor.
B. 330 Foot cable distance.
C. Single-gang decora style device.
D. Manufacturer: Extron #XTP T HWP 101 4K.

2.7 MULTIMEDIA OUTPUT STATION (XOX)

A. Converts XTP to scalable 4K HDMI for connection to TV's.
B. Includes RS-232 control signals.
C. 330 Foot cable distance.
D. Two-gang decora style device.
E. Manufacturer: Extron #XTP R HWP 201 4K

2.8 MULTIMEDIA OUTPUT STATION (XOD)

A. Converts DTP to scalable 4K HDMI for connection to council table monitors.
B. Includes RS-232 control signals.
C. 230 Foot cable distance.
D. Single-gang decora style device.
E. Manufacturer: Extron #DTP R HWP 4K 231 D

2.9 WIRED MICROPHONES

A. COUNCIL TABLE/PODIUM (EIGHTEEN THUS)

1. 18" Gooseneck type.
2. Dynamic cardioid with on/off switch.
3. Shockmount hardware.
4. Manufacturer: Shure MX418S.

B. PRESENTERS TABLE (FOUR THUS)

1. Dynamic cardioid type with on/off switch.
2. Include tabletop stand
3. Include 10' XLR cable.
4. Manufacturer: Shure SM58S.

C. BROADCAST HEADSET (ONE THUS).

1. Dual-sided broadcast headset with boom microphone.
2. 4-Pin XLR cable.
3. Manufacturer: Shure #BRH440M

2.10 WIRELESS MICROPHONES

A. Rack mounted receivers

B. Manufacturer: Shure SLXD Series.

C. Equipment

1. Shure SLXD4 series wireless receivers (TWO THUS)
2. Shure SLXD2/B58 wireless handheld transmitter (ONE THUS)
3. Shure SLXD1 bodypack with WL185 lavalier mic (ONE THUS)

D. Include one Shure UA844+SWB/LC antenna/power distribution unit with two UA8 series remote antennas.

2.11 BROADCAST CAMERA (FOUR THUS)

A. IP Broadcast Camera.

1. Full 1920x1080p HD Resolution with H.264 and H.265 streaming at 60 fps.
2. IP based PTZ control.
3. SDI full HD video streaming.
4. 20x zoom lens.
5. PoE.
6. Include ceiling mount bracket.
7. Manufacturer: PTZOPTICS Model #PT20X-SDI-GY-G2.

2.12 BROADCAST CONTROL STATION (BCS)

A. Video Switcher

1. Broadcast video switcher with preset control.
2. 4 direct SDI inputs.
3. PTZ control via ethernet.
4. Multi View HDMI output for preview.
5. HDMI output to multimedia system.
6. Roland Model #V-60HD.

B. Preview Monitor

1. Full HD resolution free standing monitor
2. HDMI input.
3. 17” diagonal screen.
4. Manufacturer: Dell or equivalent.

2.13 SMART TV

A. LED 4K UHD
B. Minimum 120 Hz or faster refresh rate.
C. Smart Capable with Integral LAN port.
D. HDMI inputs as required.
E. RS232 control capable.
F. Wall mount bracket as required.
G. Manufacturers: LG, Samsung, Sharp, Sony, Toshiba, or Vizio.
H. Size
   1. 65” Class (TWO THUS at sidewalls)
   2. 75” Class (TWO THUS at front of room)

2.14 COUNCIL TABLE MONITOR (TEN THUS)

A. LED desktop mount 15” Class
B. Full HD 1920 x 1080 resolution.
C. HDMI input.
D. Manufacturer: Beetronics Model #15HD7 or approved equal.

2.15 PERSONAL PA SYSTEM

A. The personal PA system shall be a Williams PPA 557 Pro series hearing assist system consisting of the following components:

1. One thus: PPA T45 transmitter (which may be used with any number of receivers).
2. Four thus: PPA R37 receivers, with EAR013 mini earbuds.
3. Two thus: NKL 001 neckloops
4. One thus: ANT025 remote coaxial antenna (with cable length as required).
5. One thus: TFP 048 power supply.

2.16 PODIUM TABLETOP INTERFACDE

A. Flip-top style flush mount box for power and A/V connections with cable pass through cover.
B. Cable Cubby Modules:
   1. Two retractable HDMI.
   2. One Duplex receptacle with USB A and C power.
C. Manufacturer: Extron #CableCubby 500 or approved equal.

2.17 CABLE

A. Speaker cable: #14 gauge, two-wire stranded, shielded, with overall jacket, plenum rated.

B. Multimedia Input/Output and Controller cable: Extron #XTP DTP 24.

C. Microphone cable: #22 gauge, two-wire stranded, shielded, with overall polyvinyl jacket. Belden: #8451 or equivalent.

D. Provide all HDMI, USB, CAT6, and AUDIO patch cords as required for complete system.

PART 3 – EXECUTION

3.1 STORAGE

A. Store public address components in a cool, dry space prior to installation.

3.2 INSTALLATION

A. General

1. Install in accordance with code, product listing, and manufacturer's instructions.
2. All equipment and cabling described in this Section shall be installed by the Supplier listed this Section.
3. The Division 26 Contractor shall provide conduit where cables are concealed in walls, in mechanical rooms, and in rooms without ceilings.
4. Exercise particular care in the installation of control rough-in boxes to ensure plumb and level placement.
5. Clearly mark all incoming cables and wires as to origin.
6. Verify exact mounting height/position of TV with Owner prior to installation.
7. Verify exact mounting location of the Tabletop Equipment with Owner prior to installation.
8. Obtain required IP addresses for equipment from Owner and perform complete setup of each device.

B. Special care in cable installation shall be taken to ensure that grounds do not occur because of careless terminations or damage to the jacket of the shield. Take special care to ensure that random contact of shields of adjacent cables do not occur in consoles and at junction boxes.

3.3 FINAL ADJUSTMENT AND EQUALIZATION

A. When the system is completely installed and operating properly (with all spurious responses such as hum, oscillation, etc. eliminated), the system shall be adjusted for even sound pressure level coverage, and then be equalized using 1/3 octave technique.

B. The process will also provide location and reduction of acoustic feedback and ring points utilizing 1/3 octave filter panel. This portion of the equalization process will be accomplished with equipment specifically designed for this purpose.

C. The system energy time curve and an energy frequency curve shall be measured using Techron System 12 TEF analyzer. All tests shall be performed by a TEF factory-trained technician.

D. Include serial number of the TEF machine and photocopy of the "Certificate of Participation" in a TEF Technical Workshop.

E. Include following documentation with the Record Manuals:

1. An overall seating plan showing sound pressure levels at six different locations using 80dBm as a reference pressure level.
2. Raw and final room response curves plotted on log charts specifically designed for this purpose.
3. Complete operational instructions, individual device circuit diagrams and a one-line diagram of the system.

3.4 TESTS

A. Prior to final inspection, verify that the public address system is in proper working condition. Furnish letter of verification to Engineer indicating that the system has been tested by a manufacturer’s representative. List date of test and name of manufacturer’s representative. Division 26 contractor responsible for test and scheduling.

3.5 INSTRUCTIONS

A. Manufacturer's representative shall instruct Owner in proper operation, maintenance and testing of the complete system. Indicate on letter of verification, name of Owner's representative receiving instructions.

B. Instruction period shall be for a period of 4 hours unless otherwise acceptable to Owner.

C. Record instructions and include with Record Manuals in accordance with Section 260500.

3.6 CLEANING

A. Clean and vacuum interior to remove all wire and insulation scraps, dust and dirt.

B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 275410 – RESCUE ASSISTANCE SYSTEM

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Furnish and install a complete Rescue Assistance System.

B. Description of Work

1. System to operate as follows:
   a. Voice communication is initiated by depressing the call station button transmitting the signal to a central annunciator panel. A single pulse tone and lighted button signals the caller that the alarm has been sent. The caller need not take any other action to communicate with the central annunciator. A steady red LED and intermittent tone will signal the central annunciator that a call has been received. Upon pressing the appropriate zone button, the alarm is acknowledged, the red LED begins flashing and a steady green light indicates the intercom has been activated. The lighted button at the call station begins to flash and a single pulse tone signals the caller that the alarm has been received. The central annunciator operator can depress and release the "talk" button to talk and listen to the caller. When the emergency is resolved, the central annunciator operator pushes a reset button that restores the entire system to standby status.
   b. In the event of a wiring fault, each annunciator zone button is equipped with a yellow LED that will illuminate and an alarm that will sound identifying the area requiring service.
   c. The entire system shall comply with the Americans with Disabilities Act Accessibility Guidelines 4.3.11.4.

1.2 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500.
2. Show all details, including backbox dimensions, size and performance, etc.

B. Record Manuals

1. Submit information in accordance with Section 260500.
2. Include information for operating and maintaining the system, including wiring diagrams, repair parts list, and all instructions accompanying equipment.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. The system specified is based on equipment as manufactured by Cornell Communications Solutions and other manufacturers as listed. All reference to model numbers and other pertinent information is intended to establish the standards of operational concepts, performance, quality and appearance which must be met.

2.2 EQUIPMENT

A. Annunciator:

1. Provides audible and distinctive flashing visual station identification placed on all call stations.
2. Selectable individual two-way communication with each call station.
3. Faceplate constructed of .125" thick anodized aluminum with permanently silk-screened zone designations and operator instructions.
4. Switches:
    a. Push-to-talk switch.
    b. Switch with two internal LED indicators for each zone.
    c. System reset switch.
5. Audible alarm emitting a minimum sound level of 90db at 30 cm.
6. Zones: 4
7. Provided with recessed backbox for flush-mounting face plate.
8. Manufacturer: Cornell Communications Solutions #4200 Series or equivalent.

B. Call station:

1. Provides audible and visual identification indicating a call has been initiated.
2. Provides two-way voice communication with system annunciator.
3. Push button call switch with red LED.
4. Audible alarm emitting a minimum sound level of 70 db at 30 cm.
5. Two-gang stainless steel faceplate with permanently silk-screened operator instructions.
6. Manufacturer: Cornell Communications Solutions #4201 or equivalent.

C. Power supply:

1. Provided with battery back-up.
2. Input voltage: 120 VAC; output voltage: 24 VDC, 3 amps.
3. Provided with the back box for surface-mounting. Back box nominal: 12" H x 14" W x 4" D.
4. Manufacturer: Cornell Communications Solutions #5243 or equivalent.

D. Telephone Access Kit:

1. Fully programmable auto dialer and digital annunciator.
2. Provides access to a public telephone system.
3. Places a call to a designated location via a public telephone line for alarm notification.
4. Powered from a 120 VAC source.
5. Manufacturer: Cornell Communications, Inc. #TAK-4202 or equivalent.

PART 3 – EXECUTION

3.1 STORAGE

A. Store Rescue Assistance System components in a cool, dry space prior to installation.

3.2 INSTALLATION

A. General

1. Install in accordance with Code, product listing, and manufacturer's recommendations.
2. All wiring to comply with all National, State, and Local Fire Codes.
3. Exercise particular care in the installation of control rough in boxes to ensure plumb and level placement.
4. Conductors:
   a. Quantity as required by manufacturer.
   b. Color coding: Manufacturer/supplier requirements.
   c. Enclosed in conduit.
5. Conduit:
   a. Size per NEC.
6. Terminations:
   a. Connect all devices according to manufacturer's data.
   b. Made on terminal strips with separate joint for each conductor.
   c. Number identify all conductors to agree with terminal strip numbering.
7. Locate devices as generally shown on Drawings and as specifically indicated on installation instructions. Verify exact locations with the Architect prior to rough-in.
8. Provide 3/4" fire-resistant, plywood backing for surface power supply panel.
   a. Paint all exposed surfaces gray, including edges.
9. Install power supply overcurrent protective device in location that is accessible only to authorized personnel.
10. Provide 1/2" conduit from telephone access kit to nearest data patch panel, with four-pair minimum Category 6 UTP voice cable terminated on programmable auto dialer.
11. Program telephone access kit such that upon phone pick up/emergency dial at a call station, a call is place to the facilities security control room.

3.3 TESTING

A. Prior to final inspection, verify that the Rescue Assistance Program system is in proper working condition. Furnish letter of verification to Engineer indicating that the system has been tested. List date of test and names of those in attendance.

B. Notify Owner, Engineer, and local Fire Marshall or Fire Chief one week in advance of scheduled tests. Division 26 Contractor responsible for test coordination and scheduling.

3.4 INSTRUCTIONS

A. Manufacturer's representative to instruct Owner in proper operation, maintenance and testing of the complete Rescue Assistance System. Indicate on letter of verification, name of Owner's representative receiving instructions.

B. Record instructions and include with Record Manuals in accordance with Section 260500.

3.5 CLEANING

A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.

B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 280500 – DIVISION 28 GENERAL PROVISIONS

PART 1 – GENERAL

1.1 DESCRIPTION

A. The provisions and requirements of Section 260500 shall be applicable to Division 28.

B. All Division 28 work shall be included under the Division 26 contract.

C. The Contractor shall take special note that any conflicts between the Contractor and any Division 28 subcontractors shall not become an issue of the Engineer or Owner. It shall be the Contractor's responsibility to coordinate with the Division 28 subcontractor/s to determine where their work leaves off and where the subcontractor's work begins. The Contractor shall be responsible for all specified work including the operations of work under Division 28.

END OF SECTION

SECTION 281300 – CONTROLLED ACCESS SYSTEM

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Furnish and install a complete controlled access system. Include software licenses, proximity readers, door sensors, power supplies, control panels, cabling and other such products, equipment and wiring normally required for a complete and operational system.

2. All work in conjunction with this installation shall meet the provisions of the National Electrical Code and any other applicable codes.

B. Description of System

1. System to operate as follows:
   a. Control electric strike door locks at locations indicated on drawings.
   b. Provide access through doors via proximity card readers, momentary contact switches, or maintained contact/panic switches.
   c. Monitor door positions.
   d. Log all activities and provide override functions of system.
   e. Provide paging to owner designated representative upon trouble alarm.
2. Rooms 103-122 always remain secure even during a fire alarm event.
3. During a fire alarm event all exterior doors, office doors, stairwells, and conference room doors, unless noted above, are unlocked and elevators are authorized to access all floors.
4. During occupied/business hours exterior doors, except 107A, are unlocked.
5. Control elevator access to first floor via card reader. The south elevator will always be controlled access to first floor except during a fire alarm event. The center elevator will allow access to first floor during occupied/normal business hours and restrict access to authorized personnel at all other times.

1.2 SUBMITTALS

A. Shop Drawings

1. Provide information in accordance with Section 260500.
2. Indicate:
   a. Mounting details.
   b. Cabinet dimensions.
   c. Wiring diagrams.
   d. Description of devices.
   e. Floor plan layout of devices.
   f. Connection/riser diagram for specific project involved.

B. Manual

1. Provide information in accordance with Section 260500.

2. Include complete data for operation and maintenance of the system, consisting of:
    a. Wiring diagrams.
    b. Testing.
    c. Maintenance.
    d. Description of system operation.
    e. Addition of devices.
    f. Frequency of testing procedures.
3. Provide three copies, one to remain in control panel, other copies for Record Manuals.

PART 2 – PRODUCTS

2.1 MANUFACTURER/SUPPLIER

A. The system specified is based on equipment as manufactured by Keyscan Access Control Systems and Altronix Power Supplies. All references to model numbers and other pertinent information is intended to establish the standards of operational concepts, performance, quality and appearance which must be met.

B. Acceptable suppliers:

1. Computer Store, 1100 S Broadway, Minot, ND, (701) 838-3967.
2. Convergint Technologies, 4655 Trenton Dr., Bismarck, ND, (701) 712-1072.
3. Electro Watchman, Inc., 4715 19th St SE, Mandan, ND, (701) 258-6169.
4. Innova Integrated Systems, 1800 22nd Ave SW, Minot, ND, (701) 837-0131.
5. Newvision, 1313 Republic St. Bismarck, ND, (701) 222-8888.

2.2 CENTRAL SYSTEM

A. Access Control Software

1. Windows 10 and Apple Compatible.
2. Page owner designated representative upon trouble alarm.
3. Support for 45,000 credentials.
4. Computer generated graphic overlay of building system to indicate location of troubles alarms.
5. Video Management Software Integration: Interface with building surveillance system to key on camera when a trouble alarm is indicated.
6. Manufacturer: Keyscan Aurora, RS2, or approved equal.

B. Server

1. Standard 19” rack mount chassis, 1U space.
2. Intel Core i7 processor and two solid state drives in RAID 1 configuration.
3. Redundant power supplies.
4. Preloaded Windows 10 Pro software with full remote client access via internet connection.
5. BCDVideo BCD102SD-ACS or approved equal.

C. Control Panel (CACP)

1. Each 8-door control panel shall include all Keyscan or Mercury component cards and the associated electric strike power supply equipment in a single Altronix Trove series wall mount enclosure.

a. Control System components
    1) Eight door controller
    2) 16 aux inputs, 8 aux outputs.
    3) Ethernet option for Netcom and CIM.
    4) Low voltage power supply.
    5) Integral battery backup.
    6) Keyscan #CA8500 series or equivalent by Mercury Security.

b. Electric strike power supply.
    1) 24VDC, 10 amp continuous output.
    2) Eight output individually PTC protected non power-limited output terminals as required by specific system topography.
    3) Integral battery backup with low power shut down.
    4) Capable of individually selectable fire alarm interface.
    5) Altronix #eFlow NAD Series.

2. Quantity of 8-door control panels as required to accommodate the number of controlled doors shown on the drawings.

D. Proximity Readers

1. Indoor/Outdoor IP55 rated.
2. Wiegand output.
3. Transmitting frequency 125 kHz, 13.56 MHz, and 2.4GHz.
4. Mobil Credential reading with Bluetooth and near field communications.
    a. Support for both Apple and Android operating systems for mobile credentials.
5. Supply Voltage Range 5/16 VDC.
    a. Standard Type
        1) 1.4-4.0” read range at 12VDC.
        2) Single-Gang rough-in mounting.
        3) Manufacturer: HID Model # Signo 40 or equivalent by WaveLynx.
    b. Mullion Type
        1) 1.4-4.0” read range at 12VDC
        2) Surface mount design
        3) Manufacturer: HID Model # Signo 20 or equivalent by WaveLynx.

E. Panic Device Power Supply (PDPS)
1. 24VDC, capable of providing 15 amp inrush current.
2. 2 individually controlled outputs with 0.75 amp continuous supply.
3. Integral battery backup.
4. Capable of fire alarm interface.
5. Altronix #StrikeIt1 Series

F. Momentary Contact Switches

1. Single pole double throw momentary contact pushbutton.
2. Surface mount with stainless steel cover.
3. Manufacturer: Schlage Model# 660-PB, or equivalent.

G. Maintained Contact/Panic Switches

1. Silent Operation.
2. Double-pole double-throw contacts for multi-notifications.

3. Surface mount with stainless steel cover.
4. Convenient reset key for testing and/or reset of alarm.
5. Manufacturer: Honeywell #269R.

H. Panic Button Outlets

1. Panic Button Jacks:
2. Wall Jack: Single outlet RJ11 (Female), six pin/six wire, modular construction.
3. Flyout Lead: Single RJ11 (Male) with 10’ of cable, capable of being removed and relocated with desk to alternate location.
4. Faceplates: Single gang, vertical faceplate accepting modular jack(s). Manufacturer: Panduit #CFP series plates. Color as selected by Architect.
5. Where Panic Button and voice/data outlet are shown ganged together on the Drawings, device plates furnished under Section 271500.

I. Cards

1. Pre-programmed Key Card Style.
2. 32k bit proximity technology.
3. Photo ID Compatible.
4. Ability to be used with a strap and clip as a photo ID badge.
5. Passive, no battery design.
6. Quantity: 150.
7. Manufacturer: HID iClass SE Model #3104.

J. Direct-To-Card Printer

1. Single sided printer compatible with iClass cards.
2. Windows 10 software.
3. Include one complete set of replacement ribbon cartridges.
4. Manufacturer: HID Fargo DTC4250e.
5. ID Camera
    a. 1080p Webcam with mini tripod.
    b. Logitech C922 series or equivalent.

K. Electric Door Strikes.

1. 24 Volt DC.
2. Supplied and installed by others.

L. Mortized Electric Latch (panic device)

1. 24 Volt DC.
2. Low Power Version
    a. 1.0 Amp inrush (0.5 sec)
    b. 0.15 Amp holding.
3. Power transfer hardware.
4. Supplied and installed by others.

M. Door Sensors

1. Man-Door Type
    a. Flush-mount type suitable for steel or wood doors.

b. Suitable for supervised inputs.
c. Manufacturer: Interlogix Model #1078 Series or equivalent.

N. Cabling

1. Card Reader Cable.
   a. 6 conductor, 22 AWG, shielded.
   b. Plenum rated.
   c. 500' length limit.
2. Electric Strike Cable.
   a. 2 conductor, 18 AWG, shielded.
   b. Plenum rated.
   c. 500' length limit.
3. Door Sensor Cable
   a. 2 conductor, 22 AWG.
   b. Plenum rated.
   c. 500' length limit.
4. Network Cable
   a. Cat 6. See Specification 271500 for details
5. Panic Button Cabling
   a. 2 conductor, 18 AWG, shielded.
   b. Plenum rated.
   c. 500' length limit.

PART 3 – EXECUTION

3.1 STORAGE

A. Store access system components in a cool, dry space prior to installation.

3.2 INSTALLATION

A. General

1. Install in accordance with Code, NRTL-listing and manufacturer's recommendations.
2. Wiring to comply with all National, State and Local Codes.
3. Locate devices as generally shown on Drawings and as indicated on installation instructions.
4. Provide conduit where cables are concealed in walls, in mechanical rooms, and in rooms without ceilings.

B. Server

1. Install Access Control Server in data rack adjacent to ACP's or where shown on the drawings.

C. Proximity Readers

1. Standard type to be installed on solid walls. Use mullion type on any curtain wall systems or controlled doors with glass sidelights. Coordinate installation of any mullion style readers with supplier of frame system.
2. Where installed on masonry walls, readers shall be installed such that the top of the reader is even with block coursing

3.3 TESTS

A. Furnish a letter of verification to Engineer indicating that the system has been tested by manufacturer's representative and is found to be complete and functional. List date of test and name of manufacturer's representative. Testing to include a functional test of all devices and verification of proper supervision for all devices. Notify Owner and Engineer one week in advance of scheduled tests.

3.4 INSTRUCTIONS

A. Manufacturer's representative shall instruct Owner in proper operation, maintenance and testing of the complete alarm and detection system. Indicate on letter of verification, name of Owner's representative receiving instructions.

B. Record instructions and include with manual in accordance with Section 260500.

3.5 CLEANING

A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.

B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 281301 – NORTHLAND HEALTH CONTROLLED ACCESS SYSTEM

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Furnish and install a complete extension of the existing Northland Health Dental clinic controlled access system. Include software licenses, proximity readers, door sensors, power supplies, control panels, cabling and other such products, equipment and wiring normally required for a complete and operational system.

2. All work in conjunction with this installation shall meet the provisions of the National Electrical Code and any other applicable codes.

B. Description of System

1. System to operate as follows:
   a. Control electric strike door locks at locations indicated on drawings.
   b. Provide access through doors via proximity card readers.
   c. Monitor door positions.
   d. Log all activities and provide override functions of system.
   e. Provide paging to owner designated representative upon trouble alarm.

1.2 SUBMITTALS

A. Shop Drawings

1. Provide information in accordance with Section 260500.
2. Indicate:
   a. Mounting details.
   b. Cabinet dimensions.
   c. Wiring diagrams.
   d. Description of devices.
   e. Floor plan layout of devices.
   f. Connection/riser diagram for specific project involved.

B. Manual

1. Provide information in accordance with Section 260500.
2. Include complete data for operation and maintenance of the system, consisting of:
   a. Wiring diagrams.
   b. Testing.
   c. Maintenance.
   d. Description of system operation.
   e. Addition of devices.
   f. Frequency of testing procedures.
3. Provide three copies, one to remain in control panel, other copies for Record Manuals.

PART 2 – PRODUCTS

2.1 MANUFACTURER/SUPPLIER

A. The system specified is based on equipment as manufactured by Honeywell. All references to model numbers and other pertinent information is intended to establish the standards of operational concepts, performance, quality and appearance which must be met.

B. Acceptable suppliers:

1. Protech Integrations, 1131 12th Ave SW, Minot, ND (701) 720-5730.

2.2 CENTRAL SYSTEM

A. Access Control Software

1. Existing Honeywell NetAxs System.

B. Control Panel (CACP)

1. Each 2-door control panel shall include all component cards and the associated electric strike power supply equipment in a single wall mount enclosure.

2. Honeywell Model# NetAxs Series.

C. Proximity Readers

1. Indoor/Outdoor IP55 rated.
2. Wiegand output.
3. Transmitting frequency 125 kHz and 13.56 MHz.
4. Supply Voltage Range 5/16 VDC.
    a. Standard Type
        1) 2.5-4.0” read range at 12VDC.
        2) Single-Gang rough-in mounting.
        3) Manufacturer: Honeywell # OP40HONS
    b. Mullion Type
        1) 2.0-3.0” read range at 12VDC
        2) Surface mount design
        3) Manufacturer: Honeywell # OP10HONS

D. Electric Door Strikes.

1. 24 Volt DC.
2. Supplied and installed by others.
    a. Basis of design are the Von Duprin 6000 Series or HES 1006 Series.

E. Door Sensors

1. Man-Door Type
    a. Flush-mount type suitable for steel or wood doors.
    b. Suitable for supervised inputs.
    c. Manufacturer: Interlogix Model #1078 Series or equivalent.

F. Cabling

1. Card Reader Cable.
   a. 6 conductor, 22 AWG, shielded.
   b. Plenum rated.
   c. 500’ length limit.
2. Electric Strike Cable.
   a. 2 conductor, 18 AWG, shielded.
   b. Plenum rated.
   c. 500’ length limit.
3. Door Sensor Cable
   a. 2 conductor, 22 AWG.
   b. Plenum rated.
   c. 500’ length limit.
4. Network Cable
   a. Cat 6. See Specification 271500 for details

PART 3 – EXECUTION

3.1 STORAGE

A. Store access system components in a cool, dry space prior to installation.

3.2 INSTALLATION

A. General

1. Install in accordance with Code, NRTL-listing and manufacturer’s recommendations.
2. Wiring to comply with all National, State and Local Codes.
3. Locate devices as generally shown on Drawings and as indicated on installation instructions.
4. Provide conduit where cables are concealed in walls, in mechanical rooms, and in rooms without ceilings.

B. Proximity Readers

1. Standard type to be installed on solid walls. Use mullion type on any curtain wall systems or controlled doors with glass sidelights. Coordinate installation of any mullion style readers with supplier of frame system.
2. Where installed on masonry walls, readers shall be installed such that the top of the reader is even with block coursing

3.3 TESTS

A. Furnish a letter of verification to Engineer indicating that the system has been tested by manufacturer’s representative and is found to be complete and functional. List date of test and name of manufacturer’s representative. Testing to include a functional test of all devices and verification of proper supervision for all devices. Notify Owner and Engineer one week in advance of scheduled tests.

3.4 CLEANING

A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.

B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 282300 – SURVEILLANCE SYSTEMS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Furnish and install a complete and operational surveillance system. The system shall be an IP-based system with the ability to view and record IP cameras via Operator Workstations connected to the IP-based local area network (LAN). Video shall be in H.265 format and connected to the LAN.
2. Include:
   a. IP cameras, camera lenses, camera housings, and mounting hardware.
   b. Camera power supplies (where specified).
   c. An independent video LAN, including but not limited to: servers, network video recorders, POE network switches and all patchcords.
   d. Client/user meetings to appropriately configure and program the software based upon the client's needs.
3. Equipment shall conform to the requirements of FCC and EIA rules and regulations covering television equipment. All work in conjunction with this installation shall meet the provisions of the National Electrical Code and any other applicable codes.
4. Provide all system hardware and software licenses required for complete and operational system. These shall include as a minimum server licensing, database licensing, client licensing (including cameras if applicable), application licensing, etc. This shall not include licensing required for new devices added after the time of final contract acceptance or added outside of this project. All software shall be the latest compatible version at time of commissioning. Software maintenance and licensing fees for equipment and software installed and operational at the time of commissioning shall not require additional service or maintenance fees to maintain the system in an operational state, until such a time that the system is modified with new equipment or additional equipment.

B. Work Not Included

1. Network cable installation between cameras and termination racks shall be provided under Section 271500. Surveillance system installer shall coordinate exact cable installation requirements with cabling installer and Owner's IT representative.
2. For multiple rack installations, fiber optic backbone cabling shall be provided under Section 271510. Surveillance system installer shall coordinate strand requirements with Owner's IT representative.

C. Description of System

1. The surveillance cameras shall provide for the monitoring of:
   a. Interior areas – as shown on Drawings.
   b. Exterior of the building – as shown on Drawings.

2. The LAN shall be SNMP-managed, Gigabit, Ethernet network consisting of: Managed devices (including but not limited to: PoE network switches, servers, workstations, etc.), an Agent (software which runs on managed devices), and network management system (NMS – software which runs on the manager). All network-attached devices shall support SNMP (Simple Network Management Protocol) and be monitored for conditions that warrant administrative attention. The new Surveillance System network shall be a physically isolated network, carrying only traffic related to the Surveillance System. A Layer 2 egress point will be identified to facilitate access as required to the Owner's data network. The Contractor shall use IP address space as provided by the Owner (the Owner will furnish a range of IP addresses to be used only for devices connected to the Surveillance System network).
3. Provide one dedicated workstation to run the client software and display the Owner requested camera views on a minimum of two wall monitors in Room 104. Verify with the PSAP Manager and Police Operations Commander which cameras will be displayed.
4. At room 107 display alleyway Type C camera on dedicated wall monitor.
5. Provide dedicated viewing station in City IT department for system management. Field verify installation location with Owner on-site.

1.2 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500.
2. Indicate mounting details, lens type, power requirements, connection diagrams (system and internals), and description of system functions.
3. Floor plan layout of surveillance system indicating location of cameras, camera names/numbers, and data rack termination mapping. Upon request, the Engineer will furnish AutoCAD files of the floor plan. Submit one copy to Engineer for approval. Upon receipt of Engineer's approval, provide **additional four** copies. Submit one copy to Engineer. Remaining copies for Contractor use at the project site and for Record Drawing/Manual submittal at project closeout (redlined to indicate actual conditions of installation).

B. Manuals

1. Submit information in accordance with Section 260500.
2. Include manufacturer's data for adjustment, operation and maintenance of equipment and name of service organization.
3. Provide multiple copies, one to remain in equipment cabinet, other copies for manuals.

PART 2 – PRODUCTS

2.1 MANUFACTURER/SUPPLIER

A. The system specified is based on equipment as manufactured by Hanwha Techwin (Samsung) and other manufacturers as listed. All reference to model numbers and other pertinent information is intended to establish the standards of operational concepts, performance, quality and appearance which must be met.

1. Equivalent systems as manufactured by Avigilon.

B. Contractors/Subcontractors performing Section 282300 work shall be certified for installation of specific equipment by the equipment manufacturer.

C. Acceptable installers:

1. Electro Watchman, Inc., 4715 19th St SE, Mandan, ND 701/258-6169
2. Computer Store, 1100 S Broadway, Minot, ND 58701, 701/838-3967.
3. Innova Integrated Systems, 1800 22nd Ave SW, Minot, ND, 701/837-0131.
4. Newvision, 1313 Republic St. Bismarck, ND, 701/222-8888.
5. Simtech, Inc., 7021 Socorro Place, Bismarck, ND 701/751-6002.
6. Wheeler Construction, 1720 South Broadway, Minot, ND, 58701, 701/852-5584.
7. SRT Communications, 3615 N. Broadway, Minot, ND, 58701, 701/858-1200.
8. Pro IT, 308 2nd Ave SW Suite 6, Minot, ND, 58701, 888/776-4828.
9. Installers not listed above and wishing to quote shall refer to Specification 260500-1.4 for approval procedure. No consideration shall be given to any installer not pre-approved.

2.2 CAMERAS

A. General Requirements:

1. All cameras shall be PoE network cameras connected directly to the IP network, and shall be remotely viewed, controlled, and recorded through the video management and recording software.
2. All cameras shall utilize either H.264 or H.265 Video Compression Format.
3. All cameras will be vandal resistant and incorporate motion detection technologies.
4. All cameras shall be provided with lenses suitable for the desired camera views. Fixed lenses shall be varifocal type. Cameras monitoring specific doors shall have lenses adequately adjusted to identify the individual at the door. Cameras monitoring outdoor activity, long corridors, and large indoor areas shall have lenses adequately adjusted to identify the nature of the activity in the area.
5. All outdoor camera enclosures shall be IP 66 rated (Ingress protection classification) and be equipped with a heater capable of operating in the temperature range of -30°C to 55ºC (-22°F to 131ºF).

B. Type A
1. 4MP bullet type with motion detection and outdoor rated (IP66) housing.
2. Day/Night (ICR), 120dB Wide Dynamic Range, 20fps at full resolution.
3. Hanwha Model #QNO-8080R.
    a. Include #SBO-126B backbox.
4. Avigilon Model #5.0C-H5SL.
    a. Include #H4-BO-JBOX1 backbox.
5. Axis Model #P1447-LE
    a. Include #TP3603 backbox.

C. Type B
1. 2MP indoor/outdoor dome type with motion detection and handover capability.
2. 150dB Wide Dynamic Range, 50fps at full resolution.
3. Video analytics to include loitering, enter/exit, counting, face detection, and heatmap.
4. Hanwha Model #XNV-L6080.
    a. Include #SBV-158G backbox.
5. Avigilon Model #2.0C-H5A-DO-IR.
6. Axis Model #P3245-LVE

D. Type C
1. Indoor/Outdoor 180º multi-sensor type with motion detection and handover capability.
2. Day/Night (ICR), 120dB Wide Dynamic Range 30fps at full resolution.

3. Hanwha Model #PNM-9030V
    a. Include #SBP-276HM hanging mount.
4. Avigilon Model #9C-H4A-3MH-180.
    a. Include #H4AMH-AD-DOME1.
5. Axis Model #Q3709-PVE
    a. Include T94A01D.

E. Type D
1. 6MP Fisheye type with motion detection and handover capability.
2. 120dB Wide Dynamic Range, 30fps at full resolution.
3. Hanwha Model #XNF-8010R
    a. Include #SBF-100B1 backbox.
4. Avigilon Model #6.0L-H4F-DO1-IR.
5. Axis Model #M3057-PLVE
    a. Include #T94S01P Backbox.

2.3 CAMERA POWER SUPPLY

A. All cameras to be PoE compatible.

B. Camera(s) may connect to the nearest data rack shown on the drawings. Contractor is responsible for providing PoE switch in any data rack used for camera connections.

C. When multiple switches are utilized, the Layer 2 managed network shall be configured with edge-core topography. Cameras shall be terminated to edge switches with minimum 56Gb/s capacity and at least one core switch with minimum 176Gb/s capacity shall tie all edge switches to the servers and storage devices.

2.4 NETWORK VIDEO RECORDER (NVR)

A. Network video recorder with video management software preloaded on recorder utilizing H.264 or H.265 Video Compression Format.

B. Provide 30-day data recording capability at continuous high activity rate, at each camera type's rated recording rate.
1. Storage configuration shall be RAID 6

C. Support up to 128 camera channels per NVR.

D. Full remote client via internet connection.

E. Redundant power supply.

F. Standard 19" rack mount chassis.

G. Manufacturer: Hanwha Model #WRR-P-S202W1 Series, Avigilon NVR4 Standard Series, Axis S11 Series, or approved equal by BCDVideo.

H. PoE/PoE+ Network Switches

1. Where multiple network switches are required, an edge/core star topography shall be configured. The server and storage devices, as well as the client network port shall be connected

directly to the core switch. All edge switches shall be connected via fiber optic cable to the core switch. No “daisy chaining” of edge switches.

2. Core Switch: Aruba 3810 Series or equivalent with SFP+ network modules as required.

3. Edge Switches: Aruba 2930 Series or equivalent 24 or 48 port switch with 10 Gigabit SFP+ uplink.

2.5 VIDEO MANAGEMENT SOFTWARE

A. The video management software shall control the recording/storage services and operator client services utilizing real-time database synchronization by operating on a free database technology such as SQLite (included with installation). Users can connect to any system server to view live stream or playback and manage the entire system.

1. It shall support calendar search functions and advanced video analytics incorporated in the specified cameras.
2. It shall incorporate automatic camera failover to ensure limited recording loss.
3. The system shall be comprised of four applications
   a. Cloud app for simple remote connectivity, viewing, and management.
   b. Server app for managing system users, devices, and data.
   c. Desktop app for client connection or stand-alone media player.
   d. Mobile app for iOS and Android connection allowing view, search, and camera control.
4. Software licensing shall be on a per device basis (1 license per camera or I/O device) with no tier licensing for additional features or capabilities.
   a. Lifetime software version upgrades without cost to client or requirement for maintenance agreement.

B. Manufacturer: Hanwha Wisenet WAVE, Avigilon ACC7, or Axis Camera Station.

2.6 EQUIPMENT CABINET

A. Install equipment in Specification 271500 data rack.

2.7 UPS SYSTEM (UNINTERUPTED POWER SOURCE)

A. An uninterruptible power supply (UPS) shall provide backup power for a minimum period of 1 hour under 100% load. The UPS shall be “on line” type with power conditioning in either normal or backup mode.

B. Rack mount version.

C. Manufacturer: APC Smart-UPS SRT Series, CyberPower OL Series, or Powerware 5P series.

2.8 VIEWING STATION (TWO THUS)

A. Purpose built client workstation with preloaded video management software, mouse and keyboard.

B. Capable of supporting up to four display monitors via HDMI.

C. Manufacturer: Hanwha Model #WWT-P-7401L or equivalent.

D. Provide two 22-inch LED monitor with connection cables.

1. Manufacturer: Hanwha Model #SMT-2233 or equivalent

2.9 VESTIBULE VIEWING MONITOR

A. Provide one 24-inch LED wall monitor with HDMI input and wall mounting bracket.

1. Samsung Model# SR24R or equivalent

B. Provide one networked decorder to display the alleyway camera feed on the monitor.

1. Hanwha Model# SPD-151 or equivalent.

2.10 CABLE/CONNECTORS

A. Provide Category 6 and fiber optic patchcords as required to connect surveillance system equipment to the building network cabling.

PART 3 – EXECUTION

3.1 STORAGE

A. Prior to installation, store surveillance system equipment in dry area, place protected from the elements, with temperature maintained above freezing.

3.2 INSTALLATION

A. Securely install components where shown on Drawings.

B. Special care in cable installation shall be taken to ensure that grounds do not occur because of careless terminations or damage to the jacket of the cable.

C. Exterior units shall be mounted for optimum coverage and to protect camera from accidental blows and vandalism. Provide all required mounting hardware.

D. Contractor shall adjust, aim, change lenses and provide all other assistance required at final inspection to bring the system satisfactorily on-line.

E. Install in accordance with code, NRTL listing, and manufacturer's recommendations and instructions.

3.3 STARTUP

A. Prior to final inspection, verify that the surveillance system is in proper working condition. Furnish a letter of verification to Engineer indicating that the system has been tested by manufacturer's representative and is found to be complete and functional. List date of test and name of manufacturer's representative.

3.4 INSTRUCTIONS

A. Upon startup completion, the Owner shall be provided with a fully comprehensive training of the surveillance system from a Manufacturer's representative that has complete knowledge of the advanced search features and analytics features of the system. This representative shall be able to effectively demonstrate the advanced search and analytic features; and assist the Owner with implementation of these features.

B. Instructions shall consist of a minimum of three separate periods, lasting no more than 2 hours each, scheduled at Owner's convenience and completed within the following timeframe: one session at substantial completion; one session approximately 30 days after substantial completion; one approximately 60 days after substantial completion.

1. Instruction periods shall progress from basic operations to advance functions tailored to Owner's comprehension of the system.
2. Record instructions and include with Record Manuals in accordance with Section 260500

C. One additional follow up instruction period shall be implemented prior to the 1-year warranty expiration.

D. Perform any required adjustments and maintenance items that become apparent during these instruction periods, including software updates.

3.5 CLEANING

A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.

B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 283111 – FIRE ALARM AND DETECTION

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included

1. Furnish and install a complete addressable fire alarm and detection system in accordance with NFPA 72 and this specification.

B. Work not included

1. Where required, the Owner shall be responsible for:
   a. Line lease or service fees associated with signal transmission (alarm, supervisor, and trouble) to a remote central station.
   b. Any proprietary interface equipment not specified herein and required by the Owner's monitoring service.

C. Description of System

1. General: Provide a complete, non-coded, addressable, microprocessor-based fire alarm system with initiating devices, notification appliances, and monitoring and control devices as indicated on the Drawings and as specified herein.
2. Software: The fire alarm system shall allow for loading and editing instructions and operating sequences as necessary. The system shall be capable of on site programming to accommodate system expansion and facilitate changes in operation. All software shall be stored in a non-volatile programmable memory within the fire alarm control panel (FACP). Loss of primary and secondary power shall not erase the instruction stored in memory.
3. History Logs: The system shall provide a means to recall alarms and trouble conditions in chronological order for the purpose of recreating an event history. Separate alarm, supervisory and trouble logs shall be provided.
4. Wiring/Signal Transmission
   a. Transmission shall be addressable signal transmission, dedicated to fire alarm service only.
   b. Circuit Supervision: Circuit faults shall be indicated by a trouble signal at the fire alarm control panel. Provide a distinctive indicating audible tone and alphanumeric annunciation.
   c. System connections for initiating, signaling line circuits and notification appliance circuits shall be Class A or Class B as described in Part 3 of this specification.
5. Analog Smoke Detectors
   a. Monitoring: The FACP shall individually monitor detectors for calibration, sensitivity, and alarm condition, and shall individually adjust for sensitivity. The FACP shall determine the condition of each detector by comparing the detector value to the stored values.
   b. Environmental Compensation: The FACP shall maintain a moving average of the detector's smoke chamber value to automatically compensate for dust, dirt, and other conditions that could affect detection operations.
   c. Programmable Sensitivity: Smoke detectors shall have multiple sensitivity levels, programmed and monitored from the FACP.
   d. The FACP shall automatically indicate when an individual detector needs cleaning.
   e. The FACP shall continuously perform an automatic self-test on each detector, which will check detector electronics and ensure the accuracy of the values being transmitted. Any detector that fails this test shall indicate a trouble condition.

6. Analog Heat Detectors
    a. Monitoring: The FACP shall individually monitor detectors for alarm condition and shall individually adjust for fixed temperature sensing and rate-of-rise sensing. The FACP shall determine the condition of each detector by comparing the detector value to the stored values.
    b. Programmable Sensitivity: Heat detectors shall have rate-of-rise temperature detection values selectable at the FACP for either 15° F or 20° F per minute. Fixed temperature sensing is independent of rate-of-rise sensing and shall operate at either 135° F or 155° F.
    c. The FACP shall continuously perform an automatic self-test on each detector, which will check detector electronics and ensure the accuracy of the values being transmitted. Any detector that fails this test shall indicate a trouble condition.
7. Power Requirements
    a. The FACP and each required expansion panel shall receive 120-volt AC power via a dedicated 20-ampere circuit breaker from the nearest panelboard. The incoming power to each panel shall be supervised so that any power failure will be indicated at the FACP and sound a trouble signal. The primary power branch circuit supplying fire alarm equipment shall supply no other loads. The circuit breaker:
        1) Location shall be permanently identified at the corresponding control unit.
        2) Shall have a listed circuit breaker locking device installed.
        3) Shall have a red marking which shall not damage the overcurrent protective device or obscure the manufacturer's markings.
        4) Shall be permanently identified as to its purpose: "FIRE ALARM" for fire alarm systems, "EMERGENCY COMMUNICATIONS" for emergency communications systems, and "FIRE ALARM/ECS" for combination fire alarm and emergency communications systems.
    b. The FACP shall be provided with sufficient battery capacity to operate the entire system upon loss of normal AC power in a normal supervisory mode for a period of 24 hours with 5 minutes of alarm operation at the end of this period. The system shall automatically transfer to battery standby upon power failure. All battery charging and recharging operations shall be automatic. System batteries shall be supervised so that a low battery condition or disconnection of the battery shall be indicated at the control panel.
    c. All circuits requiring system-operating power shall be 24-volt DC and shall be individually fused at the control panel.
    d. The system shall support 100% of the addressable devices in alarm operation at the same time, under both primary (AC) and secondary (battery) power conditions.
8. Fire Sprinkler Monitoring
    a. Water Flow: Activation of a water flow switch shall initiate a general alarm operation.
    b. Valve Supervisory Switch (Tamper Switch): The activation of any valve supervisory switch shall activate system supervisory operations.
    c. Activation of either a water flow switch or valve supervisory switch shall distinctly report which device is in alarm at the FACP and any required remote annunciator(s).

1.2 REQUIRED SYSTEM FUNCTIONS

A. Priority of Signals: Alarm events have the highest priority. Subsequent alarm events are queued in the order received and do not affect existing alarm conditions. Supervisory and Trouble events have second-level and third-level priority respectively. Events of a higher-level priority take precedence over events of lower priority even though the lower-priority condition occurred first. Annunciate all events regardless of priority or order received.

B. Non-interfering: The activation of an addressable device does not prevent receipt of signals from subsequent activations.

C. Transmission to Remote Central Station: The FACP shall have the capability to automatically route alarm, supervisory, and trouble signals to a central station via Internet Protocol (IP) over the public open Internet.

D. Types of Signaling: The FACP shall be NRTL-listed for the applicable types of signaling methods used, i.e.: Temporal Coded, Non-Coded, March Time and/or Internet Protocol.

E. Annunciation: Operation of alarm and supervisory initiating devices shall be annunciated at the FACP and any required remote annunciator(s), indicating the location and type of device.

F. General Alarm: Activation of an alarm initiating device shall include:

1. Indication of alarm condition at the FACP and any required remote annunciator(s).
2. Identification of the device that is the source of the alarm at the FACP and any required remote annunciator(s).
3. Operation of all audible and visual notification appliances throughout the building until silenced at the FACP and any required remote annunciator(s). Audible alarm notification shall operate steady or match existing building convention.
4. Shutting down designated air handling equipment, and activating smoke dampers and exhaust fans as required by alarm input.
5. Have the capability to automatically route the signal to a Remote Central Station.
6. The control panel shall be capable of bypassing Items 4 and 5 through the use of programmable touch pads on the front of the control panel. These touch pads shall be password-protected to prevent unauthorized tampering.
7. Record the event in the FACP historical log.
8. Closing doors normally held open by magnetic door holders.
9. Initiate elevator recall in accordance with ASME/ANSI A17.1, when designated fire alarm detectors are activated.
10. Initiation of smoke control sequence.
11. Unlocking of designated doors.

G. Supervisory Operations: Upon activation of a supervisory device such as fire pump failure, low air pressure switch, and tamper switch, the system shall operate as follows:

1. Activate the system supervisory service audible signal and illuminate the LED at the FACP and any required remote annunciator(s).
2. Pressing the Supervisory Acknowledge key will silence the supervisory audible signal while maintaining the supervisory LED “on” indicating off-normal condition.
3. Record the event in the FACP historical log.
4. Transmission of supervisory signal to Remote Central Station.

H. Alarm Silencing: If the “Alarm Silence” button is pressed, all audible alarm signals shall cease. (Visual signals shall continue to operate.)

I. System Reset:

1. The “System Reset” button shall be used to return the system to its normal state. Display messages shall provide the operator assurance of the sequential steps (“IN PROGRESS”, “RESET COMPLETED”) as they occur. The system shall verify all circuits or devices are restored prior to resetting the system to avoid the potential for re-alarming the system. The display message shall indicate, “ALARM PRESENT, SYSTEM RESET ABORTED.”
2. Should an alarm condition continue, the system will remain in an alarmed state.

J. Drill: A manual activation (drill) switch shall be provided to initiate an alarm on the FACP.

K. Manual Control: Manual controls shall be supervised so that an “off normal” position of any switch shall cause an “off normal” system trouble. The “off normal” status shall be clearly identified in plain language on the FACP alphanumeric display.

1. Manual Bypass Control: The ability to perform a manual bypass of selected automatic functions shall be provided.
2. Circuit Enable/Disable Control: The system shall have provisions for disabling and enabling each circuit individually for maintenance or testing purposes.

L. WalkTest: The system shall be capable of being tested by one person without returning to the control panel to reset the system after each alarm. Enabling the one-person test feature at the FACP shall activate the “One person Testing” mode of the system as follows:

1. The control panel shall automatically log each alarm and each trouble condition tested, and reset the system for the next condition to be received. Should the walktest feature be left off for a preprogrammed length of time without any activity, the system shall revert to the normal operating mode automatically.
2. The city circuit connection and suppression release circuits shall be bypassed for the testing group.
3. Control relay functions associated to the testing group shall be bypassed.
4. The FACP shall indicate a trouble condition.
5. The alarm activation of any initiating device in the testing group shall cause the audible notification appliances to sound a code to identify the device.
6. The control panel shall automatically reset itself after signaling is complete.
7. Any momentary opening of an initiating or notification appliance circuit wiring shall cause the audible signals to sound for 4 seconds indicating the trouble condition.

1.3 SUBMITTALS

A. Shop Drawings

1. Submit information in accordance with Section 260500.
2. Indicate:
   a. Mounting details.
   b. Cabinet dimensions.
   c. Wiring diagrams.
   d. Description of devices.
   e. Floor plan layout of fire alarm system indicating location of devices, wiring between devices, and intensities of audible and visual appliances. Upon request, the Engineer will furnish AutoCAD files of the floor plan. Submit one copy to Engineer for approval. Upon receipt of Engineer’s approval, provide **additional four** copies. Submit one copy to Engineer. Remaining copies for Contractor use at the project site and for Record Drawing/Manual submittal at project closeout (redlined to indicate actual conditions of installation).

B. Record Manuals

1. Provide information in accordance with Section 260500.
2. Include complete data for operation and maintenance of the system, consisting of:
   a. Wiring diagrams.
   b. Testing.

c. Maintenance.
d. Description of system operation.
e. Addition of devices.
f. Frequency of testing procedures.
g. All data referenced in NFPA 72, 10.6.

3. Provide multiple copies (including shop drawing connection/riser diagram), one to remain in control panel, other copies for Record Manuals.

1.4 MANUFACTURER/SUPPLIER

A. The system specified is based on equipment as manufactured by SimplexGrinnell. All reference to model numbers and other pertinent information is intended to establish the standards of operational concepts, performance, quality and appearance, which must be met.

B. Other acceptable manufacturers: Autocall, Edwards Systems Technology, Gamewell-FCI, Potter Electric Signal, Notifier, Silent Knight, or Siemens Fire Safety.

1. Being listed as an acceptable manufacturer in no way relieves obligation to provide all equipment and features in accordance with this specification.

C. All equipment shall be NRTL-listed, and shall be furnished by one manufacturer to ensure listing/equipment compatibility as required by NFPA 72.

D. Supplier providing equipment and services under this Section shall have:

1. A factory-authorized service center located in North Dakota within 250 miles of the project site. Referenced service center shall be under direct control of the Supplier, staffed by employees of the Supplier, and contain an inventory of replacement material requisite for timely maintenance. Referenced service center shall be operational for a minimum five-year period or have equivalent five-year industry experience with installation and programming prior to bid opening.
2. A minimum of one employee at the above referenced service center certified by National Institute for Certification in Engineering Technologies (NICET). Certification shall be in the Fire Protection Engineering Technology field, Fire Alarm Systems sub-field, and shall be minimum Level III.

E. Acceptable Suppliers:

1. ACS, 3410 13th St NE, Minot, ND (701) 446-8840.
2. Nardini Fire Equipment Co. Inc., 303 20th St N, Fargo, ND (800) 950-1139.
3. Summit Fire Protection, 901 Page Drive, Fargo, ND (701) 280-2144.
4. SimplexGrinnell, 2821 Fiechtner Drive, Fargo, ND (800) 342-4668.
5. Simtech, Inc., 7021 Socorro Place, Bismarck, ND (701) 751-6002.

PART 2 – PRODUCTS

2.1 CENTRAL SYSTEM

A. Fire Alarm Control Panel (FACP)

1. General: Comply with UL 864, “Control Panels for Fire-Protective Signaling Systems.”
2. Cabinet:
   a. Steel enclosure with lockable, hinged door for front access. Surface or flush-mount style as indicated on the Drawings.

b. Color: Red when surface-mounted in equipment rooms, and beige, black or gray when flush-mounted in other locations.

3. The following FACP hardware shall be provided:
   a. Power limited base panel with 120-volt AC input power.
   b. Addressable point capacity: Size for requirements of Drawings and Specifications, minimum of 240 points expandable to 1,000 points, inclusive of inputs and outputs in any combination (SimplexGrinnell #4010ES series).
   c. Appropriate initiating device circuit (IDC) and notification appliance circuit (NAC) modules to support Class A or Class B circuits as described in Part 3 of this specification
   d. Alphanumeric Display and System Controls: FACP shall include an 80 character LCD display to indicate alarm, supervisory, and component status messages and shall include a keypad for use in entering and executing control commands.
   e. Notification appliance circuits: Size for requirements of Drawings and Specifications, minimum of 4 required.
   f. Two form "C" auxiliary output circuits (rated 2A @ 24-volt DC, resistive), operation is programmable for trouble, alarm, supervisory or other selective control operations. Provide capability for switching up to 1/2 A @ 120-volt AC, inductive loads.
   g. Secondary (emergency) power supply including: battery(s), charger and automatic transfer switch. Battery(s) shall be sealed lead-acid type.
   h. An IP communicator to automatically route the alarm signals to a Remote Central Station.
      1) Designed to monitor the status of the FACP and report to a Remote Central Station as follows:
         a) Alarms.
         b) Troubles.
         c) Supervisory conditions.
      2) The transmission path shall be supervised at an interval of 60 minutes or less.
      3) Module Types:
         a) Direct connect IP communication module.
         b) IP dialer capture module to convert Digital Alarm Communicator information to IP protocol.
   i. Supervised serial communication circuit for control and monitoring of remotely located LCD annunciator(s) and I/O panels.

B. Expansion Panels

1. NAC Extender
   a. Stand-alone panel capable of:
      1) Powering a minimum of four non-addressable notification appliance circuits. Each circuit rated 2 A @ 24-volt DC.
      2) Controlling non-addressable notification appliances.
   b. Internal power supply and battery charger capable of charging internal-mounted batteries or batteries mounted in an external cabinet where required.
   c. Connected to the FACP via addressable communications circuit. Via the communications circuit each output notification appliance circuit can be individually controlled for general alarm or selective area notification.
   d. Alarms from the FACP shall signal the NAC extender panel to activate. The panel shall monitor itself and each of its NACs for trouble conditions and shall report trouble conditions to the FACP.
   e. Input power: 120-volt AC.

C. Alarm Initiating Devices

1. Manual fire alarm station:
   a. “Address capable”
   b. Non-coded single action.
   c. Provide two spare stations.
2. Automatic area smoke detection station:
   a. “Address” capable.
   b. Photoelectric plug-in “head” unit which mounts to a twist-lock base.
   c. Individual station sensitivity levels are selected and monitored at the control panel.
   d. Self-restoring.
   e. Provide three spare stations.
3. Automatic duct smoke detection station:
   a. “Address” capable.
   b. Same as automatic area smoke detection station, except with associated duct housing and sampling tubes as required.
   c. Refer to Motor and Equipment Schedule for equipment requiring duct detection.
4. Automatic area heat detection station:
   a. “Address” capable.
   b. Combination rate-of-rise and fixed temperature rate compensated sensing plug-in “head” unit, which mounts to a twist-lock base.
   c. Individual station rate-of-rise temperature levels are selected and monitored at the control panel. Fixed temperature level is independent of rate-of-rise levels and shall operate at 135° F or 155° F. Select appropriate mode.
   d. Locations requiring temperature ratings exceeding 155° F may include hardwired detector on an addressable base.
   e. Self-restoring.
   f. Low profile.
   g. White.
   h. Provide two spare stations of each rating.
5. Automatic Carbon Monoxide (CO) detection station:
   a. “Address” capable.
   b. Same as automatic area smoke detection station, with additional CO sensor integrated into either the detector “head” or the twist-lock base.
   c. Provide one spare CO station.

D. Alarm Notification Appliances (Non-addressable)

1. Audible alarm notification appliance
   a. Piezoelectric type horn.
   b. Flush mount.
   c. Red finish.
   d. Comply with UL 464.
   e. Class A operation.
2. Visual alarm notification appliance
   a. Xenon or LED flash tube and associated lens/reflector system.
   b. Comply with Americans With Disabilities Act (ADA).
   c. Minimum of four (4) field selectable strobe intensity settings: 15, 30, 75 and 110 candela. All settings shall be UL 1971 listed for both wall and ceiling mount applications. Select strobe intensity for each unit as dictated by location and NFPA 72, 7.5.
   d. "Fire" lettering on housing or lens.
   e. Comply with UL 1971.
   f. Class A operation.

3. Where shown ganged together on Plans, combine audible and visual alarm notification appliances into one red device.
4. Manufacturer: Same as control panel.

E. Auxiliary Devices

1. Magnetic door holder:
   a. 24 volt or match existing.
   b. Extra low profile for use with concealed wiring.
2. Individual addressable module (IAM):
   a. Module provides supervised, location specific addressability, to a single initiating device by monitoring normally open, dry contacts. Closure of contacts initiates an alarm or trouble signal as required by the device being monitored.
   b. Used to provide addressable monitoring of devices such as flow or tamper switches, etc.
   c. Powered directly from signaling line circuit. No separate power source required.
   d. Mount in single-gang box, minimum 2-1/2" deep.
   e. Included with flush or surface cover as required.
   f. Provide a separate IAM for each device being monitored.
3. Individual addressable relay module (Relay IAM):
   a. Module provides control and status tracking of a Form "C" SPDT, dry contact.
   b. Module power and communications provided directly from the signaling line circuit.
   c. Used to provide addressable control functions such as elevator recall, HVAC control, fan control, damper control, etc.
   d. Mount in standard 4" square box.
   e. Included with flush or surface cover as required.

F. Manual Shutdown

1. Manual shutdown capability included with motor starter.

G. Automatic Shutdown

1. Automatic shutdown capability for air handling equipment where required by NFPA 90A.
2. Locate fan shutdown relays remote from fire alarm control panel, controlled by integral relay in fire alarm control panel, with bypass switch.
3. Refer to Motor and Equipment Schedule for equipment requiring automatic shutdown.
4. Wiring: Two-wire parallel independent circuit to fire alarm control panel.

H. Remote Annunciator

1. Alphanumeric LCD display with the same "look and feel" as the FACP operator interface.
2. Status LED's provide system status in addition to LCD display information. Status LEDs included for:
   a. Alarm.
   b. System trouble
   c. System supervisory.
   d. Alarm silenced.
   e. Power on.
3. Should an abnormal condition be detected the appropriate LED shall flash. The unit audible signal shall pulse for alarm conditions and sound steady for trouble and supervisory conditions. When acknowledged, the LED shall remain on until reset.

4. Captive key switch enables following push buttons:
    a. Alarm acknowledge.
    b. Trouble acknowledge.
    c. Alarm silence.
    d. System reset.
    e. Supervisory acknowledge

I. Fire Sprinkler System Equipment

1. Flow switch(es) and valve supervisory switches furnished and installed by Fire Sprinkler Contractor, wired by Electrical Contractor.
2. Fire sprinkler alarm notification appliance (bell or audible-visual signaling unit) furnished by Fire Sprinkler Contractor, installed and wired by Electrical Contractor.

J. Elevator Fire Sprinkler/Power Module Switch

1. Interface with the elevator fire sprinkler/power module switch such that activation of the elevator and /or elevator equipment room fire sprinkler flow switch(es) shall disconnect the elevator power circuit via the power module shunt trip operator.
2. Interface with fire alarm voltage monitoring relay furnished with power module switch to comply with NFPA 72.
3. Provide fire alarm IAM(s) as required by elevator power module switch characteristics.
4. Refer to “Elevator Fire Sprinkler/Power Module Switch Interface” Detail on the Drawings.

K. Clean Agent Suppression System

1. Provide fire alarm IAM(s) as required to interface with clean agent suppression system control panel to monitor trouble and supervisory conditions. Activation of the suppression system shall activate the fire alarm notification appliances.

PART 3 – EXECUTION

3.1 STORAGE

A. Store fire alarm components in a cool, dry area prior to installation.

3.2 INSTALLATION

A. General

1. Install in accordance with code, product listing, and manufacturer's recommendations.
2. Wiring to comply with all national, state and local fire codes.
3. All fire alarm circuitry shall be installed in raceway unless otherwise noted. Refer to Section 260533 for acceptable raceways.
4. Conductors:
    a. Quantity as required by manufacturer.
    b. Signaling Line Circuits (SLC):
        1) Two-conductor #18 AWG, twisted pair shielded cable. Plenum rated where required.
        2) NFPA 72 Class A, “T” tapping not permitted (exceptions as per NFPA 72, 23.4.2.2 acceptable).
    c. Alarm notification appliance circuits (NAC):
        1) Solid, #14 AWG minimum, size for maximum 5% voltage drop.
        2) Voice Evacuation Appliances

a) Audible: Two-conductor #16 AWG, twisted pair shielded cable.
b) Visual: Solid, #14 AWG minimum, size for maximum 5% voltage drop.

3) NFPA 72 Class A, "T" tapping not permitted (exceptions as per NFPA 72, 23.4.2.2 acceptable).
4) Audible appliances (horns) controlled separately from visual appliances.
5) All visual appliances shall flash in synchronization.

d. Miscellaneous Circuits: (such as magnetic door holders & etc.)
1) Solid, #14 AWG minimum, size for maximum 5% voltage drop.

e. Color Coding: Manufacturer/Supplier requirements.
f. Enclosed in raceway system (i.e. conduit).
g. To ensure proper supervision of initiating and indicating circuitry, three wires maximum per wire-nut.

5. Raceway Systems:
a. Size raceway systems and junction boxes as per NEC.
b. All junction boxes, junction box covers and raceway systems except those embedded directly in earth or concrete, or surface metal raceway systems (wiremold), shall be externally identified by permanent bright red paint suitable for the purpose, to easily distinguish from other communication or power raceway systems. Items shall be painted prior to installation. In addition to field painted conduit, factory painted conduit as manufactured by Allied Tube & Conduit (Fire Alarm™ EMT), acceptable.
c. Route outgoing and return Class A circuits in separate conduits (exceptions as per NFPA 72, 23.4.2.2 acceptable).
d. Multiple circuits acceptable in same raceway system.

6. Terminations:
a. Connect all devices according to manufacturer's data.
b. Made on terminal strips with separate joint for each conductor.
c. Number identify all strips as shown in wiring diagram included with manual.
d. Number identify all conductors to agree with terminal strip numbering.
e. When required, end of line devices to be mounted on terminal strips in the FACP.
f. Wire-nut terminating not acceptable.

7. Do not zone alarm notification appliances. Rather, route notification appliance circuits (NAC's) with signaling line circuits (SLC's). Terminate and jumper as required to maintain supervision on identified terminal strips.
8. Locate devices as generally shown on Drawings and as specifically indicated on installation instructions.
9. Remote fan shut-down relays to be mounted near controller or equipment.
10. Where control panel is shown to be surface-mounted, provide 3/4" grade AD, fire-resistant, gray painted (including edges), plywood backing.
11. Provide 1/2" conduit from fire alarm control panel to nearest network rack offering internet access. Provide a four-pair minimum Category 5e UTP data cable terminated to the IP communicator module. Ensure owner's internet access equipment complies with secondary power requirements as required by NFPA 72. If owner provided internet access is not available, provide additional dedicated IP equipment as required to obtain internet service in conformance with NFPA 72.
12. Provide elevator/fire alarm interface as per Section 262822.

B. Smoke Detectors

1. Locate as generally shown on Drawings and as specifically indicated in NFPA 72 and on installation instructions.

a. All detectors in rooms with gas fired equipment shall include CO sensor.

2. Provide protective plastic wrapping to prevent entrance of construction dust. Field-install during construction. Remove immediately prior to supplier testing. Replace protective plastic wrapping and remove day of final inspection.
3. All smoke/heat detection devices shall be located a minimum of 3’ from any supply, return, or exhaust air diffusers/grills.

C. Duct Detectors

1. Installed and arranged to automatically initiate general alarm.
2. Provide at a suitable location in the return air stream prior to exhausting from building or being diluted by outside air.
3. Provide at a suitable location in main supply duct on downstream side of filters.
4. Refer to Motor and Equipment Schedule for equipment requiring duct detection.
5. Locate as specifically indicated in NFPA 72 and on installation instructions. Coordinate with supplier's representative prior to installation, exact location to ensure accurate sampling of air stream. Provide quantity as required by duct geometry.
6. Do not install head on sampling tube base in housing until final supplier testing, unless a protective cover is included with the detector head.

D. Remote Annunciator

1. Flush mounting.
2. Gangable switch box as required.
3. Minimum two #14 AWG conductors and one #18 AWG twisted shielded pair, or as required by manufacturer.

E. Fire Sprinkler System Equipment

1. See Mechanical Drawings and Specifications for locations and quantities.
2. Valve supervisory switches:
    a. Integral contact shall serve as supervisory initiating device for separate “Address”.
    b. Supervisory only. Will not sound general alarm, or "Trouble".
3. Flow Switch:
    a. Consists of two Form “C” (NO-NC) contacts.
    b. One contact shall serve as alarm initiating device for separate “address”.
    c. Second contact shall control fire sprinkler alarm notification appliance. Connect to nearest 120 volt egress circuit. Provide transformer and relay as required.

F. Clean Agent Suppression System

1. Peripheral initiation and annunciation devices for the suppression system shall be supplied/installed by suppression system supplier.
2. System Control Panel
    a. Provide 120 volt power as required.
    b. Provide interface wiring for equipment shut down as indicated.
    c. Integral contact shall serve as supervisory initiating device for separate supervisory “address”.
    d. Integral contact shall serve as trouble initiating device for separate trouble “address”.
    e. Integral contact shall serve as alarm initiating device for separate alarm “address”.

3.3 TESTS

A. Prior to final inspection, verify that the fire alarm system is in proper working condition, free from false alarms. Furnish a letter of verification to Engineer indicating that the system has been tested by manufacturer's representative and is found to be complete and functional. List date of test and name of manufacturer's representative. Indicate in letter that testing was in accordance with NFPA 72, Chapter 10, including re-acceptance testing when applicable. Include copies in control panel and Record Manuals.

B. Notify Owner, Engineer, and Local Fire Marshall or Fire Chief one week in advance of scheduled tests. Electrical Contractor responsible for test coordination and scheduling.

3.4 INSTRUCTIONS

A. Manufacturer's representative shall instruct Owner in proper operation, maintenance and testing of complete fire alarm and detection system. Indicate on letter of verification, name of Owner's representative receiving instructions.

B. Record instructions and include with Record Manuals in accordance with Section 260500.

3.5 CLEANING

A. **Clean** and **vacuum interior** to remove all wire and insulation scraps, dust and dirt.

B. Clean all exposed surfaces immediately prior to final inspection.

END OF SECTION

SECTION 31 6615 - HELICAL FOUNDATIONS PILES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Helical anchors used to support tension loads.

B. Helical piles used to support compression loads.

1.02 PRICE AND PAYMENT PROCEDURES

A. Base bids on anchor/pile quantity and lengths as indicated in structural drawings.

B. If the actual number of installed anchors/piles or the total installed length differs, an adjustment to the Contract Sum will be made based on unit prices defined in the Agreement.

C. No additional payment will be made for withdrawn, damaged, rejected, or misplaced piles; for any portion of a pile remaining above the cut-off elevation; for backdriving; for cutting off piles, or for any cut off length of piles.

D. Quantity and length measurements will be determined by Installation Logs kept and submitted by Contractor and verified by Architect, based on the following:
   1. Length: By the linear foot measured from point to existing site elevation as indicated.
   2. Test Anchors/Piles: Assume 5 feet longer than longest designed length.

1.03 DEFINITIONS

A. Specific terms used in this section are defined below. Terms not defined below are defined in DFI TM-GLOS-1 first and then by common usage.

B. Extension Section: Helical foundation component installed between lead section and load transfer device.

C. Effective Torsional Resistance: Average installation torque typically taken over a distance equal to last three diameters of penetration of largest helix plate.

D. Geotechnical Capacity (or, Ultimate Soil Capacity): Maximum load resisted.

E. Lead Section: First helical foundation component installed in soil.

F. Limit State: Condition beyond which a helical foundation component is unfit for service.
   1. Serviceability Limit State: Foundation no longer useful for its intended function.
   2. Strength Limit State: Foundation is unsafe.

G. Loads: Forces or other actions that result from weight of all building materials, occupants and their possessions, environmental effects, differential movement, and restrained dimensional changes. Permanent loads are those loads in which variations over time are rare or of small magnitude. All other loads are variable loads (see also Nominal Load below).

H. Load Test: Procedure to test capacity and relation of load to movement.

I. Mechanical Strength: Maximum tension load resisted by structural elements of helical foundation.

J. Nominal Load: Magnitude of loads determined by Architect, including dead load, live load and other imposed by building code requirements

K. Reveal: Distance along longitudinal axis from ground surface to end of last installed extension of a foundation.

L. Safety Factor: Ratio of ultimate pullout resistance to nominal load.

M. Ultimate Pullout Resistance: Limit state based on lesser of mechanical strength or geotechnical capacity and defined as point at which helical foundation can resist no additional load.

1.04 REFERENCE STANDARDS

A. AISC 360 - Specification for Structural Steel Buildings 2016 (Revised 2021).

B. ASTM A29/A29M - Standard Specification for General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought 2020.

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.

E. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021a.

F. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel 2021, with Editorial Revision.

G. ASTM D1143/D1143M - Standard Test Methods for Deep Foundation Elements Under Static Axial Compressive Load 2020.

H. DFI TM-GLOS-1 - Deep Foundation Institute Technical Manual; Glossary of Foundation Terms 1981.

I. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections 2014, with Errata (2015).

J. SAE J429 - Mechanical and Material Requirements for Externally Threaded Fasteners 2014.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation meeting: Conduct a preinstallation meeting one week prior to start of work of this section; require attendance by all affected installers.

1.06 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Product list, with manufacturer's model designations; published capacities for installed assemblies, including load transfer devices.

C. Design Data: Submit documentation of foundation design, signed and certified by foundation designer; include:
   1. Statement that proposed foundations meet specified design criteria.
   2. Nominal load on each foundation element.
   3. Maximum allowable installation torque of each selected product.

4. Calculated theoretical geotechnical capacity.
5. Minimum effective torsional resistance requirements.
6. Minimum embedment lengths and such other site specific embedment depth requirements.
7. Inclination angle and location tolerance requirements.
8. Pre-tensioning requirements, if any.

D. Designer's Qualification Statement.

E. Installer's Qualification Statement.

F. Surveyor's Qualification Statement.

G. Installation Logs:
   1. Submit final copy of all installation logs within two weeks after completing all helical foundation work.

H. Project Record Documents: After work is complete, submit certification from surveyor that installed foundation locations are as shown on drawings.

1.07 QUALITY ASSURANCE

A. Designer Qualifications: Experienced in design of helical foundations of the type involved on this project, as evidenced by:
   1. State registration/licensure as a professional engineer.
   2. Recognition by local authority having jurisdiction.
   3. List of three or more similar projects designed within the previous three years and names of project representatives who can verify such participation.
   4. Manufacturer's written recommendation.

B. Installer Qualifications: Experienced in installation of helical foundations of the type involved on this project, as evidenced by:
   1. Manufacturer's certificate of competency in installing helical piles.
   2. List of three or more similar projects completed within the previous three years and names of representatives who can verify such participation.
      a. If an installer does not have direct experience of three or more projects with a helical pier (from the approved manufactures list), they must provide written documentation of a secondary company, whom does meet the previous experience requirements, who will oversee the installation procedure from start to finish.
      b. The secondary company (experienced installer) will act as the contractor, responsible-in-charge for all helical's installed on site.
      c. The secondary company is to be responsible for maintaining a supervisor on site during the entire installation of the helical foundations.
      d. The secondary (overseeing) company will need to take on all liabilities for installation requirements (including but not limited to depths, torques, locations, battering, etc.)
      e. If the installer would like to become a future approved installer, they must receive certifications, along with letters of recommendations which illustrate a level competence for a total of 3 projects within a 3 year span.
   3. Letter from manufacturer stating ability and intent to provide on-site supervision.
   4. List of all safety violations lodged against installer within previous three years and current status/final resolutions thereof.

C. Surveyor Qualifications: Engineer or land surveyor licensed in the State in which the Project is located.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Helical Piles and Anchors:
   1. Foundation Supportworks, Inc; [_____]: www.foundationsupportworks.com/#sle.
   2. Atlas Foundations.
   3. Torcsill: www.torcsill.com.
   4. Cantsink Of Atlanta: cantsinkatlanta.com
   5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 HELICAL FOUNDATION DESIGN CRITERIA

A. It is Contractor's responsibility to design, or obtain qualified design, of the helical foundations as indicated in Contract Documents.
   1. Information necessary for design that is contained in Contract Documents includes:
      a. Locations of foundation elements.
      b. Nominal design load for each foundation element, including dead load, live load and other loads required by building codes.
   2. Subsurface geotechnical data may be obtained from project geotechnical report & subsequent report addendums. The report may not be available immediately at time of bid, but will be available for the design phase after bids are awarded..

B. Helical Foundation Elements: One or more helical deformed plates (helix plates) attached to a central shaft with a load transfer device for attachment to a structure; entire element resisting applied loads by soil pressure.
   1. Design foundations to support/resist the nominal design loads shown on drawings in accordance with AISC 360 Allowable Stress Design method.
   2. Select foundation elements based on allowable installation torque and calculated minimum embedment length; maximum embedment length, if any; and minimum effective torsional resistance.
   3. Corrosion Service Life: 100 years minimum.
   4. Use solid square shaft helical anchors where subject to tension alone.
   5. Use hollow, round shaft helical foundations where subject to compression only or to alternating tension and compression.

C. Helical Anchors:
   1. Base design on published capacities that represent entire anchor including couplings and connections.
   2. Safety Factor: 2 times ultimate pullout/bearing resistance, minimum.
   3. Axial Deflection at Nominal Tension Load: 1/8 inches, maximum.
   4. Pre-tensioning of anchors is acceptable method of reducing deflection at service loads.

D. Helical Piles:
   1. Design with pile shaft sections in direct contact with couplings and no coupling bolts or welds in load path.
   2. Safety Factor: 2 times ultimate bearing resistance, minimum.
   3. Deflection: As indicated on drawings.
   4. Fit Up Tolerance: 1/16 inch, maximum.

2.03 MATERIALS

A. All Components: Hot-dipped galvanized in accordance with ASTM A123/A123M.

B. Bolts: SAE J429, Grade 8, bolts with nut.

C. Couplings: Integral to shaft.

D. Anchor Plates or Pile Caps: Load-transfer assembly welded from structural steel complying with ASTM A36/A36M.

PART 3 EXECUTION

3.01 PREPARATION

A. Protect structures near the work and underground utilities from damage.

B. Mark underground utilities as required by authority having jurisdiction. Avoid contact with all marked underground facilities.

C. Locate the starting point of installation in relation to existing site elevation.

D. Notify Owner at least 72 hours prior starting to installation.

3.02 INSTALLATION

A. Install helical foundations as shown on drawings and approved design documentation. In event of conflict between drawings and approved anchorage design documentation, do not begin construction on any affected items until such conflict has been resolved.

B. Comply with manufacturer's written installation requirements and recommendations for specific project site and conditions.

C. Use installation methods that will not cause damage to existing adjacent or nearby structures.

D. Keep and submit a log of helical foundation installations, including the following data:
   1. Date and time of installation.
   2. Location of foundation element.
   3. Installed foundation type and configuration.
   4. Foundation reveal.
   5. Total length of installed foundation element.
   6. Installed inclination of foundation element.
   7. For compression piles, installation torque measurements taken in one to three foot increments of total length.
   8. Actual effective torsional resistance.
   9. Calculated geotechnical capacity based on actual torsional resistance and soil parameters appropriate for subsurface conditions within three helix diameters above helix depth.
   10. Comments pertaining to interruptions, obstructions, or other relevant information.

E. If required, position inclined helical anchors perpendicular in order to assist in advancement into soil before establishing required batter angle; after initial penetration, establish required angle of inclination

F. Engage helical sections into soil and advance in a smooth, continuous manner at a rate of rotation of 5 to 25 RPM.

G. Apply sufficient down pressure to uniformly advance helical sections a distance per revolution approximately equal to pitch of helix plates.

H. Adjust rate of rotation and magnitude of down pressure for specific soil conditions and depths.

I. Provide extension sections as required to achieve required results.

J. Achieve both minimum embedment length and minimum effective torsional resistance prior to terminating foundation installation.

K. Install in battered fashion as to avoid conflict of any existing foundation elements.

L. Location Tolerances:
   1. Pile Head Horizontal Tolerance: Within 1 inch of location shown on drawings.
   2. Pile Shaft Angular Tolerance: Within 2 degrees of inclination angle shown on drawings.
   3. Employ surveyor to document actual locations of foundation elements.

3.03 ACHIEVEMENT OF EFFECTIVE INSTALLATIONS

A. In the event that the initial installation of a foundation element does not achieve both minimum embedment length and minimum effective torsional resistance, adjust, repair, or replace that foundation element so that it does achieve both requirements.
   1. The following procedures are considered acceptable and do not require prior approval unless otherwise indicated.
   2. All other proposed remedies must be approved by Owner prior to implementation.

B. Minimum Embedment Length Achieved Before Achieving Minimum Effective Torsional Resistance: Use one of the following procedures:
   1. Continue installation to greater depths until minimum effective torsional resistance is achieved, provided that, if maximum length constraint is applicable, continued installation does not exceed said maximum length.
   2. Demonstrate acceptable foundation performance through testing.
   3. Replace foundation with one having a different helix configuration, as follows:
      a. Embed replacement to a length placing last helix at least three times its own diameter beyond position of first helix of replaced foundation.
      b. Achieve minimum effective torsional resistance.
      c. Do not exceed any applicable maximum embedment length.
      d. Test replacement.

C. Allowable Torque Rating Reached Before Achieving Minimum Embedment Length: Use one of the following procedures:
   1. If permitted by Owner or EOR, terminate installation at length achieved.

D. Failure of Field Quality Control Test: Use one of the following procedures:
   1. Install foundation to a greater depth and installation torque and re-test provided that, if a maximum embedment length constraint is applicable, continued installation will not exceed said maximum length constraint.
   2. Replace foundation with one having a different helix configuration. Embed last helix at least three times its own diameter beyond position of first helix of replaced foundation without exceeding

any applicable maximum embedment length requirements. Re-test replacement.

3. If approved by Owner, de-rate load capacity of helical foundation and install additional foundations at positions that are at least three times diameter of largest helix away from any other foundation locations; space anchors in cohesive soils not closer than four helix diameters.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Owner will employ independent agency to continuously observe all testing which is to be completed by helical installer.

C. Test installed helical foundations indicated per ASTM D1143/D1143M

D. Failure of Tests: Replace or re-drive, and re-test, helical foundations that any fail test and cannot be remedied using any of the procedures described above in "ACHIEVEMENT OF EFFECTIVE INSTALLATIONS" article.

END OF SECTION

SECTION 32 3300 - SITE FURNISHINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Benches.

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's specifications and descriptive literature, installation instructions, and maintenance information.

C. Shop Drawings: Indicate plans for each unit or group of units, elevations with model number, overall dimensions, construction, and anchorage details.

1.03 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide manufacturer’s warranty against defects in materials or workmanship for ductile iron castings for a period of 10 years from Date of Substantial Completion.

C. Provide manufacturer’s Lifetime Warranty against defects in materials or workmanship for wood benches manufactured from solid teak.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wood Benches:
   1. Sitecraft: www.site-craft.com.
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 WOOD BENCHES

A. Materials:
   1. Wood: Yellow cedar.

B. Slat Benches: Solid wood supports and seat section without back.
   1. Basis of Design: Site Craft BKF Series.
   2. Shape: Rectangle.
   3. Length: 72 inches (1829 mm).
   4. Mounting: Ground.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify proper installation of mounting surfaces, preinstalled anchor bolts, and other mounting devices; and ready to receive site furnishing items.

B. Do not begin installation until unacceptable conditions are corrected.

3.02 INSTALLATION

A. Install site furnishings in accordance with approved shop drawings, and manufacturer's installation instructions.

END OF SECTION

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A602	SECOND FLOOR FINISH PLAN	11/04/21		
A603	THIRD FLOOR FINISH PLAN	11/04/21		
A604	INTERIOR FINISH SCHEDULE	11/04/21		
A605	INTERIOR FINISH SCHEDULE	11/04/21		
A611	INTERIOR ELEVATIONS	11/04/21		
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A613	INTERIOR ELEVATIONS	11/04/21		
A614	INTERIOR ELEVATIONS	11/04/21		
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MECHANICAL				
FP101	1ST FLOOR FIRE SUPPRESSION	11/04/21		
FP102	2ND FLOOR FIRE SUPPRESSION	11/04/21		
FP103	3RD FLOOR FIRE SUPPRESSION	11/04/21		
MECHANICAL				
M001	REFERENCE SHEET	11/04/21		
M101	1ST FLOOR PIPING DEMOLITION	11/04/21		
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M103	3RD FLOOR PIPING DEMOLITION	11/04/21		
M104	1ST FLOOR HVAC DEMOLITION	11/04/21		
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M303	3RD FLOOR PIPING	11/04/21		
M304	1ST FLOOR HVAC	11/04/21		
M305	2ND FLOOR HVAC	11/04/21		
M306	3RD FLOOR HVAC	11/04/21		
M307	ROOF MECHANICAL PLAN	11/04/21		
M401	MECHANICAL DETAILS	11/04/21		
M402	MECHANICAL SCHEDULES	11/04/21		
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E100	SCHEDULES & DETAILS	11/04/21		
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E105	EXISTING RISER	11/04/21		
E106	REVISED PARTIAL RISER	11/04/21		
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E110	MULTIMEDIA DETAILS	11/04/21		
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E400	FIRST FLOOR POWER PLAN	11/04/21		
E401	ENLARGED ROOM POWER DETAILS	11/04/21		
E402	SECOND FLOOR POWER PLAN	11/04/21		
E403	THIRD FLOOR POWER PLAN	11/04/21		
E404	ROOF ELECTRICAL PLAN	11/04/21		
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E503	ENLARGED ROOM SYSTEM DETAILS	11/04/21		

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

THESE PROGRESS DRAWINGS HAVE BEEN PREPARED BY THE ARCHITECT AND THE ENGINEERS TO INCLUDE ADDENDA, RFI'S, ASI'S AND CHANGE ORDERS ISSUED TO DATE.

THESE DRAWINGS ARE PREPARED AS A COURTESY AND ARE NOT PART OF THE FORMAL DOCUMENTS ISSUED FOR CONSTRUCTION AND BIDDING.

THESE DRAWINGS ARE NOT TO REPLACE ANY OF THE FORMALLY ISSUED ADDENDUM, RFI'S AND CHANGE ORDERS.

THE ARCHITECT AND ENGINEERS ASSUME NO LIABILITY FOR THE ACCURACY AND COMPLETENESS OF THESE DOCUMENTS.

CITY PROJECT #4466

JLG architects

11/4/2021 10:16:07 AM

PROJECT MATERIAL ID LIST

MATERIAL ID	SPEC. SECTION & DESCRIPTION
ALCRTIN-1	08 4413 - GLAZED ALUMINUM CURTAIN WALLS
ALSTOR-1	08 4313 - ALUMINUM-FRAMED STOREFRONTS
ALSTOR-2	08 4313 - ALUMINUM-FRAMED STOREFRONTS
BCS-1	10 2800 - BABY CHANGING STATION; POLYETHYLENE
BENCH-10	10 5113 - LOCKER ROOM BENCH
CG-3	10 2600 - CORNER GUARD - STAINLESS STEEL
CMU-1	04 2000 - STANDARD GREY CMU
COMP PNL-20	07 4243 - PHENOLIC RESIN COMPOSITE WALL PANELS
COMP PNL-21	07 4243 - PHENOLIC RESIN COMPOSITE WALL PANELS
COMP-1	10 2113.19 - PLASTIC TOILET COMPARTMENT
CPT-1	09 6813 - TILE CARPETING
CPT-2	09 6813 - TILE CARPETING
CPT-3	09 6813 - TILE CARPETING
CPT-4	09 6813 - TILE CARPETING
CPT-5	09 6813 - TILE CARPETING
CPT-6	09 6813 - TILE CARPETING
DRAIN BD-1	07 1300 - DRAINAGE BOARD
EPDM-1	07 5300 - BALLASTED EPDM ROOFING SYSTEM
FCAB-1	10 4400 - FIRE EXTINGUISHER CABINET
FILM-1	08 8000 - DECORATIVE FILM
FR PRF-40	07 8205 - BLANKET FIRE PROOFING
FR STOP	07 8400 - THROUGH PENETRATION FIRESTOPPING
FUR-1	09 2116 - 7/8" DEEP HAT CHANNEL FURRING
FUR-2	09 2116 -ZEE FURRING
FUR-3	09 2116 - 1-1/2" COLD ROLLED FURRING CHANNEL
FWP-1	09 8430 - FABRIC WRAPPED ACOUSTIC PANEL
GB-18	10 2800 - GRAB BAR; 18 INCHES
GB-36	10 2800 - GRAB BAR; 36 INCHES
GB-42	10 2800 - GRAB BAR; 42 INCHES
GB-L	10 2800 - GRAB BAR; L-SHAPED
GYP BD-1	09 2116 - 5/8" TYPE X GYPSUM BOARD
GYP BD-6	09 2116 - 5/8" TYPE X MOLD RESISTANT GYPSUM BOARD
GYP BD-16	09 2116 - 5/8" GLASS MAT FACED TILE BACKER BOARD
GYP BD-20	09 2116 - 1" GYPSUM BOARD SHAFTLINER
GYP SHTG-1	09 2116 - 1/2" GLAS MAT FACED GYPSUM SHEATHING
INSUL GL-40	08 8000 - INSULATED SPANDREL GLAZING
INSUL TEMP GL-1	08 8000 - TEMPERED CLEAR INSULATED GLAZING
INSUL-1	07 2100 - XPS EXTRUDED POLYSTYRENE INSULATION
INSUL-25	07 2100 - FOIL FACED FIBER BOARD INSULATION
INSUL-26	07 2100 - MINERAL FIBER BOARD INSULATION
INSUL-36	07 2119 - CLOSED CELL SPRAY FOAM INSULATION
INSUL-50	07 5300 - FLAT POLYISOCYANURATE INSULATION (CONSTANT THICKNESS)
INSUL-51	07 5300 - TAPERED POLYISO OVER CONSTANT THICKNESS POLYISO
INSUL-80	09 2116 - ACOUSTIC INSULATION, MINERAL FIBER
LAM GL-1	08 8000 - 2 LAYERS OF 1/8" GLASS WITH 0.060 PVB LAYER
MET STUD-1	05 4000 - COLD-FORMED METAL FRAMING
MET STUD-2	09 2116 - NON-LOADBEARING METAL STUDS, 20 GA
MET STUD-5	09 2116 - SHAFTWALL FRAMING, C-H STUDS
MIR-50	10 2800 - MIRROR; FRAMELESS
MT-1	09 3000 - TILE TRIM
MT-2	09 3000 - TILE TRIM
MT-3	09 3000 - TILE TRIM
PLAM-1	06 4100 - PLASTIC LAMINATE FACED CASEWORK
PLAM-2	06 4100 - PLASTIC LAMINATE FACED CASEWORK
PLAM-3	06 4100 - PLASTIC LAMINATE FACED CASEWORK
PT-1	09 9123 - PAINT
PT-2	09 9123 - PAINT
PT-3	09 9123 - PAINT
PT-4	09 9123 - PAINT
PT-6	09 9123 - PAINT
PT-7	09 9123 - PAINT
PT-8	09 9123 - PAINT
PT-9	09 9123 - PAINT
PT-10	09 9123 - PAINT
PT-11	09 9123 - PAINT
PT-12	09 9123 - PAINT
PT-13	09 9123 - PAINT
QTZ-1	12 3600 - NATURAL QUARTZ AND RESIN COUNTERTOP
RB-2	09 6500 - RESILIENT BASE
RF BRD-1	07 5300 - 1/2" GLASS MAT FACED ROOF BOARD
ROD-1	10 2800 - CURTAIN ROD; STRAIGHT
SEALANT-1	07 9200 - JOINT SEALANT OR CAULKING WITH OR WITHOUT BACKER ROD
SHADES-1	12 2400 - ROLLER SHADES, MANUAL
SHADES-2	12 2400 - ROLLER SHADES, ELECTRIC
SMF-1	07 6200 - PREFINISHED GALVANIZED STEEL
SSM-1	12 3600 - SOLID SURFACE COUNTERTOP
SSM-3	12 3600 - SOLID SURFACE COUNTERTOP
SST-1	10 2800 - SHOWER SEAT
T-1	09 3000 - TILE
T-2	09 3000 - TILE
T-4	09 3000 - TILE
T-5	09 3000 - TILE
T-9	09 3000 - TILE
TEMP GL-1	08 8000 - 1/4" TEMPERED GLASS
TP-2	10 2800 - TOILET PAPER DISPENSER; DOUBLE ROLL
VPR RET-4	03 3000 - 15 MIL UNDERSLAB VAPOR RETARDER
VPR RET-5	07 5300 - SELF-ADHERED ROOF DECK VAPOR RETARDER
VPR RET-10	07 2500 - SELF-ADHERED OR FLUID APPLIED VAPOR RETARDER
WC-2	09 7200 - WALL COVERINGS
WC-3	09 7200 - WALL COVERINGS
WC-5	09 7200 - WALL COVERINGS
WD BLKG	06 1000 - WOOD BLOCKING
WD CLG-1	09 5100 - WOOD CEILING TILE
WD PNL-1	09 5100 - WOOD WALL PANEL
WD SHTG-30	06 1000 - 1/2" SHEATHING
WD SHTG-30F	06 1000 - 1/2" SHEATHING, FIRE RETARDANT TREATED
WD SHTG-32	06 1000 - 3/4" SHEATHING
WDT-1	06 2000 - WOOD TRIM
WTR PRF-1	07 1300 - SELF-ADHERED SHEET WATERPROOFING
WTR PRF-2	07 1300 - PRE-APPLIED SHEET WATERPROOFING

LIST OF ABBREVIATIONS

Key Name	LIST OF ABBREVIATIONS DESCRIPTION
A/E	ARCHITECT/ENGINEER
AC	ALTERNATING CURRENT
ACI	AMERICAN CONCRETE INSTITUTE
ACM	ASBESTOS CONTAINING MATERIAL
ACT	ACOUSTICAL CEILING TILE
ADA	AMERICANS W/DISABLITIES ACT
AFF	ABOVE FINISH FLOOR
AHU	AIR HANDLING UNIT
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ALT	ALTERNATE
ALUM	ALUMINUM
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ARCH	ARCHITECT
ASI	ARCHITECTURAL SUPPLEMENTAL INSTRUCTION
AWI	AMERICAN WOODWORKING INSTITUTE
BD	BOARD
BLDG	BUILDING
BM	BEAM
BOT	BOTTOM
BRG	BEARING
BTU	BRITISH THERMAL UNITS
BUR	BUILT UP ROOFING
CAB	CABINET
CB	CATCH BASIN
CG	CORNER GUARD
CI	CAST IRON
CIP	CAST IN PLACE
CJ	CONTROL JOINT
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CO	CLEAN OUT
CONC	CONCRETE
CPT	CARPET
CSMT	CASEMENT
CSWK	CASEWORK
CT	CERAMIC TILE
CUH	CABINET UNIT HEATER
CWT	CERAMIC WALL TILE
DEMO	DEMOLITION
DEPT	DEPARTMENT
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DIST	DISTANCE
DOC	DOCUMENT
DR	DOOR
DTL	DETAIL
DW	DISHWASHER
DWG	DRAWING
EA	EACH
EIFS	EXTERIOR INSULATION FINISH SYSTEM
EJ	EXPANSION JOINT
ELEC	ELECTRIC
ELEV	ELEVATOR/ELEVATION
EP	EPOXY PAINT
EQ	EQUAL
EQUP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
FD	FLOOR DRAIN
FEC	FIRE EXTINGUISHER CABINET
FF	FINISH FLOOR
FFE	FURNITURE, FIXTURE, AND EQUIPMENT
FHC	FIRE HOSE CABINET
FIN	FINISH
FLR	FLOOR
FND	FOUNDATION
FTG	FOOTING
FWC	FABRIC WALL COVERING
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERAL
GL	GLASS OR GLAZING
GWB	GYPSUM WALL BOARD
HB	HOSE BIB
HCP	HANDICAP
HDW	HARDWARE
HDWD	HARDWOOD
HM	HOLLOW METAL
HORZ	HORZONTAL
HT	HEIGHT
IBC	INTERNATIONAL BUILDING CODE
INSUL	INSULATION
JAN	JANITOR
LAM	LAMINATE
LAV	LAVATORY
MAS	MASONRY
MB	MARKERBOARD
MDF	MEDIUM DENSITY FIBERBOARD
MECH	MECHANICAL
MH	MANHOLE
ML	MATCHLINE
MTL	METAL
MTL STD	METAL STUD
NC	NON COMBUSTIBLE
NIC	NOT IN CONTRACT
NOM	NOMINAL
NTS	NOT TO SCALE
OC	ON CENTER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED
OH	OVERHEAD
OSB	ORIENTED STRAND BOARD
PB	PARTICLE BOARD
PC	PRECAST
PLAM	PLASTIC LAMINATE
PLAST	PLASTER
PLYWD	PLYWOOD
PREV	PREVIOUS
PT	PAINT
PTD	PAPER TOWEL DISPENSER
RAD	RADIUS
REINF	REINFORCEMENT

LIST OF ABBREVIATIONS

Key Name	LIST OF ABBREVIATIONS DESCRIPTION
REQ'D	REQUIRED
REV	REVERSE
RM	ROOM
RO	ROUGH OPENING
RTU	ROOF TOP UNIT
SD	SMOKE DETECTOR
SECT	SECTION
SHT	SHEET
SIM	SIMILAR
SPD	SOAP DISPENSER
SPEC	SPECIFICATIONS
SQ	SQUARE
SUSP	SUSPEND
TC	THIN COAT
TEMP	TEMPORARY/TEMPERATURE
TO	TOP OF
TP	TOILET PARTITIONS
TPD	TOILET PAPER DISPENSER
TRTD	TREATED
TS	TRANSITION STRIP
TYP	TYPICAL
UL	UNDERWRITERS LABORATORIES
UNO	UNLESS NOTED OTHERWISE
VCT	VINYL COMPOSITION TILE
W/	WITH
WD	WOOD
WDW	WINDOW

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MATERIAL INDEX

- CONCRETE; CUT/SURFACE PATTERN
- FILL; SEE STRUCTURAL
- CMU; CUT PATTERN
- CMU; SURFACE PATTERN
- GROUT; CUT PATTERN
- ALUMINUM; CUT PATTERN
- STEEL; CUT PATTERN
- MDF; CUT PATTERN
- PLYWOOD; CUT PATTERN
- SOLID SURFACE; CUT PATTERN
- WOOD; CUT PATTERN
- WOOD; SURFACE PATTERN
- RIGID INSULATION; CUT PATTERN
- TAPERED INSULATION; SURFACE PATTERN
- SPANDREL GLAZING; SURFACE PATTERN
- GLAZING; SURFACE PATTERN
- A.C.T (1); SURFACE PATTERN
- A.C.T (2); SURFACE PATTERN
- A.C.T (3); SURFACE PATTERN
- A.C.T; CUT PATTERN
- CARPET TILE; SURFACE PATTERN
- ACCENT CARPET TILE; SURFACE PATTERN
- INTERIOR GYPSUM; CUT PATTERN
- EXTERIOR GYPSUM SHEATHING; CUT PATTERN
- TILE; CUT PATTERN
- EARTH; CUT PATTERN
- PEA ROCK; CUT PATTERN
- SAND; CUT PATTERN

SYMBOLS LEGEND

ROOM IDENTIFICATION TAG
SAMPLE ROOM NAME — 101 — ROOM NAME / ROOM NUMBER

OPENING IDENTIFICATION TAGS
4444A — DOOR NUMBER
11 — WINDOW IDENTIFICATION
101 — CURTAINWALL/STOREFRONT IDENTIFICATION

COLUMN/GRID IDENTIFICATION
XX.X — NEW COLUMN/STRUCTURAL GRID
XX.X — EXISTING COLUMN/STRUCTURAL GRID
NAME, EL.= ELEVATION — ELEVATION DATUM

ASSEMBLY IDENTIFICATION
A4.25 — WALL/FLOOR/ROOF TAG

MATERIAL/OBJECT IDENTIFICATION
<?> — MATERIAL ID TAG

REVISION DELTA
1 — REVISION TAG

DRAWING IDENTIFICATION
44 / X.XX — View Name, SCALE: 1/8" = 1'-0" — DRAWING NUMBER / DRAWING NAME / DRAWING SCALE / SHEET NUMBER

SECTION IDENTIFICATION
1 / A101 — DIRECTION OF CUT / DRAWING NUMBER / SHEET NUMBER

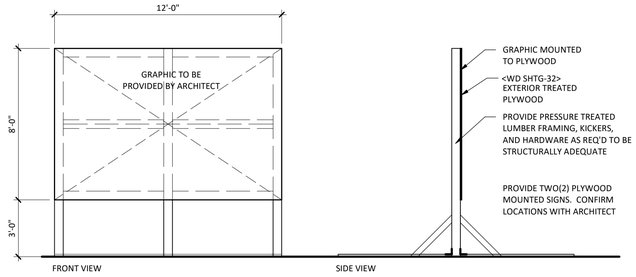
DETAIL SECTION IDENTIFICATION
1 / A101 — Ref — DRAWING NUMBER / SHEET NUMBER

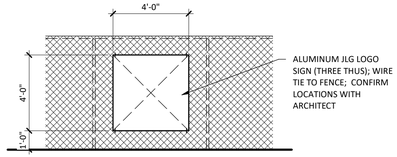
ELEVATION IDENTIFICATION
1 / A101 — ELEVATION NUMBER / SHEET NUMBER

NORTH ARROW
NORTH

SHEET KEYNOTES
1 — KEYNOTE

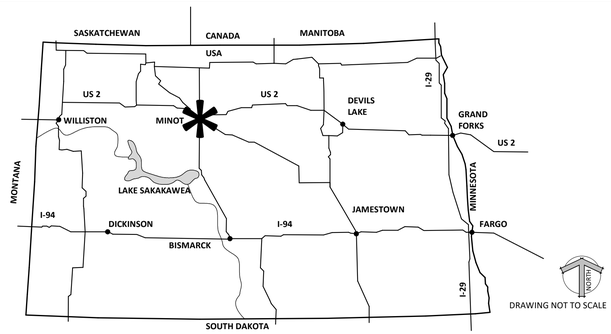
PROJECT SIGN REQUIREMENTS





PROJECT LOCAL AREA MAP - MINOT

PROJECT VICINITY MAP - ND



PROJECT GENERAL NOTES

A. SECOND LEVEL ELEVATION OF 114'-0" NOTED ON ARCHITECTURAL AND STRUCTURAL DRAWINGS EQUALS ELEVATION OF 1611.16' NOTED ON CIVIL DRAWINGS.
B. THE OWNER'S NORMAL OPERATIONS WILL BE CONTINUED DURING CONSTRUCTION. THE CONSTRUCTION SHALL NOT INTERFERE WITH THESE OPERATIONS IN ANY WAY WITHOUT THE OWNER'S EXPRESSED CONSENT.
C. IT SHALL BE EACH TRADE CONTRACTORS RESPONSIBILITY TO VISIT THE SITE AND FAMILIARIZE HIMSELF/HERSELF WITH ALL EXISTING CONDITIONS. EACH CONTRACTOR SHALL TAKE ALL NECESSARY FIELD MEASUREMENTS AND OTHERWISE VERIFY ALL DIMENSIONS AND EXISTING CONSTRUCTION CONDITIONS INDICATED AND/OR SHOWN ON THE DRAWINGS. SHOULD ANY ERROR OR INCONSISTENCY EXIST, THE CONTRACTOR SHALL NOT PROCEED WITH THE WORK AFFECTED THEREBY UNTIL REPORTING THE SAME TO THE ARCHITECT AND THE OWNERS REPRESENTATIVE FOR CLARIFICATION AND/OR CORRECTION.
D. DIMENSIONS FOLLOWED BY "+/-" OR "V.I.F." SHALL BE REVIEWED AND ALL NECESSARY ADJUSTMENTS MADE PRIOR TO FABRICATION AND/OR INSTALLATION OF WORK. NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.
E. ALL EXISTING CONSTRUCTION AND SURFACES WHICH ARE TO REMAIN BUT ARE AFFECTED BY THE WORK UNDER THIS CONTRACT SHALL BE RESTORED AND REFINISHED TO MATCH THE CONSTRUCTION, FINISH AND ALIGNMENT OF THE EXISTING ADJACENT CONSTRUCTION AND FINISHES.
F. VERIFY QUANTITY, SIZE AND LOCATION OF ALL FLOOR, ROOF AND WALL OPENINGS FOR MECHANICAL AND ELECTRICAL WORK WITH THE APPROPRIATE TRADE. PROVIDE ALL OPENINGS SHOWN OR REQUIRED FOR COMPLETION OF WORK.
G. COORDINATE SIZE AND LOCATION OF ALL ACCESS PANELS WITH APPROPRIATE TRADES. COORDINATE SIZE & LOCATION OF ALL HOUSE-KEEPING PADS AND/OR EQUIPMENT SUPPORTS WITH APPROPRIATE EQUIPMENT MANUFACTURER.
H. PROVIDE FIRE RETARDANT WOOD BLOCKING AND/OR 18 GA METAL PLATES BETWEEN STUDS AT ALL LOCATIONS REQUIRING BLOCKING IN WALL. THESE LOCATIONS INCLUDE BUT ARE NOT LIMITED TO GRAB BARS, CRASH RAILS, CABINETS, WALL HUNG SHELVES, ARTWORK, ETC.
I. THE EXTENT OF HATCHING ON DRAWINGS IS ONLY SUFFICIENT TO INDICATE THE NATURE OF THE CONSTRUCTION OR MATERIALS. TERMINATION OF THE HATCHING SHALL NOT BE CONSTRUED TO REPRESENT A CHANGE OR TERMINATION OF MATERIAL.
J. THE CONTRACTOR SHALL VERIFY THE EXISTENCE, LOCATION AND ELEVATION OF ALL UNDERGROUND UTILITIES IN WORK AREAS PRIOR TO PROCEEDING WITH CONSTRUCTION. ALL DISCREPANCIES SHALL BE DOCUMENTED AND FORWARDED TO ARCHITECT AND OWNERS REPRESENTATIVE FOR ACTION.
K. IT IS THE CONTRACTORS RESPONSIBILITY TO INVESTIGATE FIELD CONDITIONS AND PROVIDE AS NEEDED TEMPORARY SUPPORTS, SHORING AND/OR PROTECTION OF EXISTING STRUCTURES AND UNDERGROUND UTILITIES DURING EXECUTION OF WORK.
L. ALL WORK TO CONFORM TO THE REQUIREMENTS OF THE LOCAL AND STATE CODES.
M. RELEVANT DIMENSIONS AND ELEVATIONS FOR EQUIPMENT INSTALLATIONS SHALL BE VERIFIED AGAINST MANUFACTURERS CERTIFIED EQUIPMENT DRAWINGS.
N. CONTRACTOR SHALL PROVIDE TEMPORARY DUST PROOF PARTITIONS AS REQUIRED, OR WHERE REQUESTED BY OWNERS' REPRESENTATIVE. PARTITIONS SHALL BE FIRE RATED WHERE REQUIRED BY CODE HAVING JURISDICTION. ALL TEMPORARY PARTITIONS SHALL BE CONSTRUCTED IN A MANNER AND OF MATERIALS OFFERING ADEQUATE PROTECTION TO OWNER'S EQUIPMENT AND PERSONNEL.
O. DO NOT SCALE DRAWINGS TO DETERMINE SIZES AND DIMENSIONS. USE FIGURED DIMENSIONS ONLY. DIMENSIONS ARE TO FINISHED FACE OF WALLS UNLESS OTHERWISE NOTED. ALL PERIMETER DIMENSIONS ARE FROM FACE OF PERIMETER WALLS.
P. ALL PENETRATIONS TO FLOORS, CEILINGS AND WALLS SHALL BE SEALED AND FIRE STOPPED TO A FIRE RATING EQUAL TO THE CONSTRUCTION BEING PENETRATED.
Q. NEW WORK SHALL ALIGN WITH AND MATCH EXISTING WORK UNLESS NOTED OTHERWISE.

LIST OF PROJECT BID ALTERNATES

(SEE A900 SERIES & SPECIFICATIONS FOR MORE DETAIL)

ALTERNATE #1: EXTERIOR WALL INSULATION
ALTERNATE #2: EXTERIOR CURTAINWALL/STOREFRONT REPLACEMENT
ALTERNATE #3: EXTERIOR ENTRANCE IMPROVEMENTS
ALTERNATE #4: INCREASED GLAZING
ALTERNATE #5: FOLDING GLASS PARTITION AT COUNCIL CHAMBERS
ALTERNATE #6: HVAC AIR PURIFICATION SYSTEM
ALTERNATE #7: SUPERGRAPHICS
ALTERNATE #8: REPLACE COOLING TOWER
ALTERNATE #9: PARKING LOT MILL/OVERLAY
ALTERNATE #10: REPLACE EXTERIOR PARKING LOT LIGHTING
ALTERNATE #11: EXTERIOR PRECAST ACID CLEANING
ALTERNATE #12: ROOFING

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LICENSED ARCHITECT — JENNIFER BURKE JACKSON — DATE 11 04 2021 — STATE OF NORTH DAKOTA

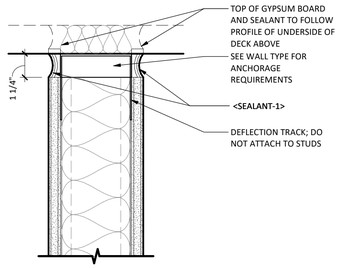
REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

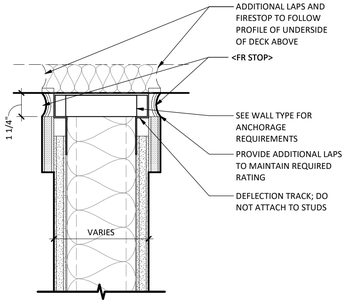
CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET G101
TITLE SHEET

11/4/2021 10:16:11 AM



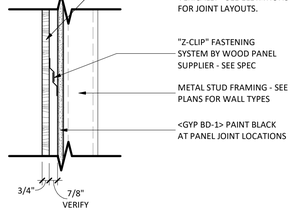
6D G102 NON-RATED PARTITION HEAD

SCALE: 3" = 1'-0"



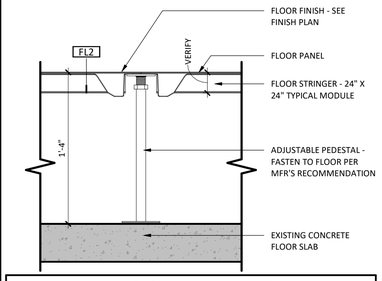
6C G102 RATED PARTITION HEAD

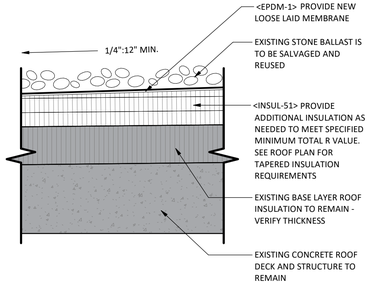
SCALE: 3" = 1'-0"

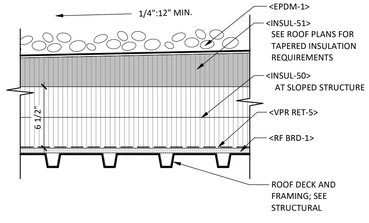


6B G102 WD PNL-1 WALL TYPE

SCALE: 1 1/2" = 1'-0"





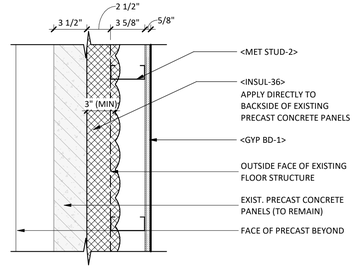


ROOF TYPE 'R2'

ROOF TAG	R-VALUE (REQUIRED)	R-VALUE (PROVIDED)	RATING	COMMENTS
R2	R35 MIN.	R35 MIN.		RE-ROOF ALTERNATE BID

ROOF TYPE 'R1'

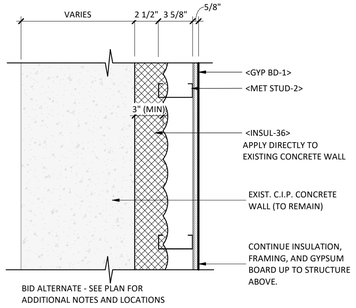
ROOF TAG	R-VALUE (REQUIRED)	R-VALUE (PROVIDED)	RATING	COMMENTS
R1	R35 MIN.	R35 MIN.		ELEVATOR HOISTWAY



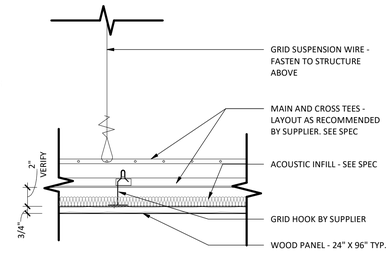
BID ALTERNATE - SEE PLAN FOR ADDITIONAL NOTES AND LOCATIONS

5C G102 2ND, 3RD FLOOR - WALL INSULATION

SCALE: 1 1/2" = 1'-0"

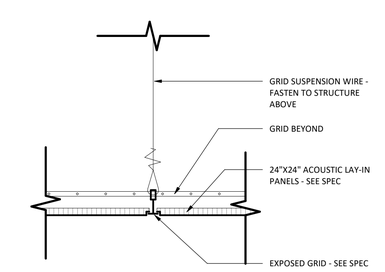


BID ALTERNATE - SEE PLAN FOR ADDITIONAL NOTES AND LOCATIONS



WOOD CEILING TYPES

CEILING TAG	DESCRIPTION
<WD CLG-1>	24"X96" SUPENDED WOOD CEILING SYSTEM, PERFORATED WITH ACOUSTIC INFILL - SEE SPEC

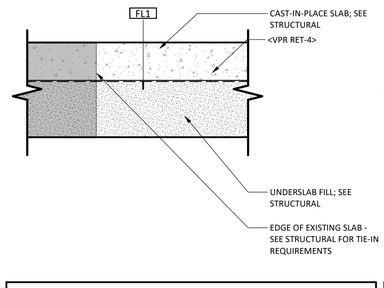


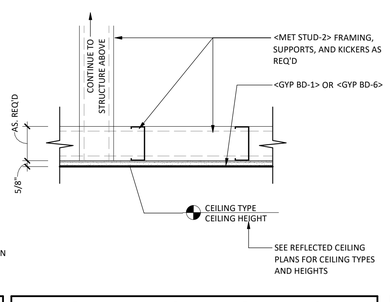
ACT-1 CEILING TYPE

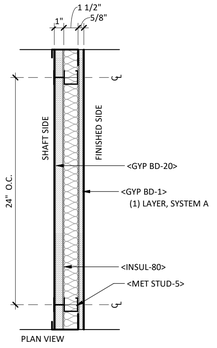
CEILING TAG	DESCRIPTION
<ACT-1>	24"X24" SUSPENDED ACOUSTIC CEILING SYSTEM

5B G102 WALL TYPE F4.A - 1ST FLOOR WALL INSUL.

SCALE: 1 1/2" = 1'-0"

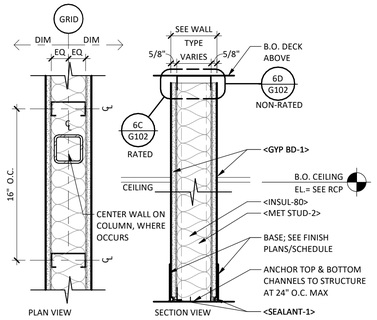






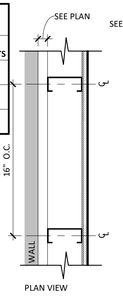
PARTITION TYPE 'S'

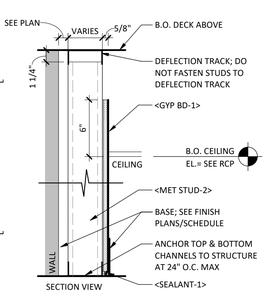
WALL TAG	STUD SIZE & SPACING	WIDTH	G.B. THK (EA. SIDE)	INSUL THICK	RATING	UL NO.	STC	COMMENTS
S4.1	2 1/2" CH STUD @24" O.C.	0' - 3 1/8"	5/8" / 1"	FILL CAVITY	1	U415		

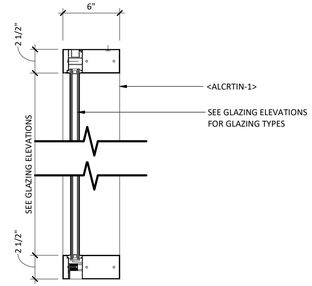


PARTITION TYPE 'A'

WALL TAG	STUD SIZE & SPACING	WIDTH	G.B. THK (EA. SIDE)	INSUL THICK	RATING	UL NO.	STC	COMMENTS
A2	2 1/2" M.S. @ 16" O.C.	0' - 3 3/4"	5/8"	FILL CAVITY	0	--		--
A4	3 5/8" M.S. @ 16" O.C.	0' - 4 7/8"	5/8"	FILL CAVITY	0	--	49	--
A6	6" M.S. @ 16" O.C.	0' - 7 1/4"	5/8"	FILL CAVITY	0	--	49	--

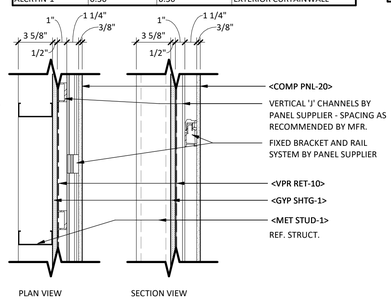






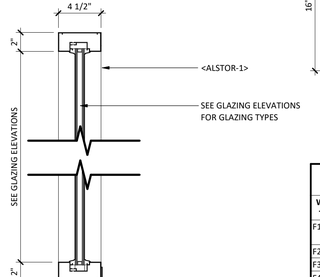
WALL TYPE 'ALCRTIN-1'

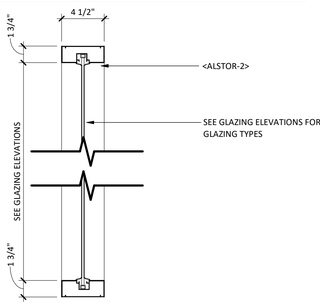
TYPE	U-VALUE (PROVIDED)	U-VALUE (REQUIRED)	COMMENTS
ALCRTIN-1	0.36	0.36	EXTERIOR CURTAINWALL

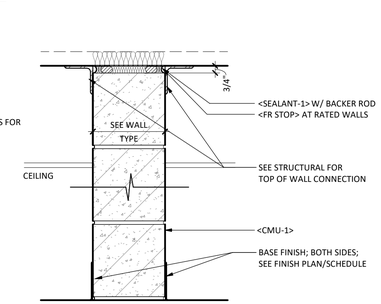


WALL TYPE 'ALSTOR-1'

TYPE	U-VALUE (PROVIDED)	U-VALUE (REQUIRED)	COMMENTS
ALSTOR-1	0.36	0.36	EXTERIOR STOREFRONT



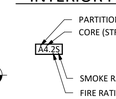




PARTITION TYPE 'F'

WALL TAG	STUD SIZE & SPACING	WIDTH	G.B. THK	INSUL THICK	RATING	UL NO.	COMMENTS
F1	7/8" HAT CHANNEL AT 16" O.C.	0' - 1 1/2"	5/8"	N/A	0	--	--
F2	1 5/8" M.S. @ 16" O.C.	0' - 2 1/4"	5/8"	N/A	0	--	--
F3	2 1/2" M.S. @ 16" O.C.	0' - 3 1/8"	5/8"	N/A	0	--	--
F4	3 5/8" M.S. @ 16" O.C.	0' - 4 1/4"	5/8"	N/A	0	--	--
F4.A	3 5/8" M.S. @ 16" O.C.	0' - 4 1/4"	5/8"	N/A	0	--	ALTERNATE 1; SEE 5D/G102

INTERIOR PARTITION LEGEND



PARTITION CLASSIFICATIONS:

A ACOUSTIC FULL HEIGHT GYP. BD. WALL
F SINGLE SIDED GYP. BD. WALLS
M MASONRY WALLS
P PARTITION WALLS (TERMINATE 6" ABOVE CEILING)
S SHAFTWALLS

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION
ALCRTIN-1	08 4413 - GLAZED ALUMINUM CURTAIN WALLS
ALSTOR-1	08 4313 - ALUMINUM-FRAMED STOREFRONTS
ALSTOR-2	08 4313 - ALUMINUM-FRAMED STOREFRONTS
CMU-1	04 2000 - STANDARD GREY CMU
COMP PNL-20	07 4243 - PHENOLIC RESIN COMPOSITE WALL PANELS
EPDM-1	07 5300 - BALLASTED EPDM ROOFING SYSTEM
FR STOP	07 8400 - THROUGH PENETRATION FIRESTOPPING
GYP BD-1	09 2116 - 5/8" TYPE X GYPSUM BOARD
GYP BD-6	09 2116 - 5/8" TYPE X MOLD RESISTANT GYPSUM BOARD
GYP BD-20	09 2116 - 1" GYPSUM BOARD SHAFTLINER
GYP SHTG-1	09 2116 - 1/2" GLAS MAT FACED GYPSUM SHEATHING
INSUL-36	07 2119 - CLOSED CELL SPRAY FOAM INSULATION
INSUL-50	07 5300 - FLAT POLYISOCYANURATE INSULATION (CONSTANT THICKNESS)
INSUL-51	07 5300 - TAPERED POLYISO OVER CONSTANT THICKNESS POLYISO
INSUL-80	09 2116 - ACOUSTIC INSULATION, MINERAL FIBER
MET STUD-1	05 4000 - COLD-FORMED METAL FRAMING
MET STUD-2	09 2116 - NON-LOADBEARING METAL STUDS, 20 GA
MET STUD-5	09 2116 - SHAFTWALL FRAMING, C-H STUDS
RF BRD-1	07 5300 - 1/2" GLASS MAT FACED ROOF BOARD
SEALANT-1	07 9200 - JOINT SEALANT OR CAULKING WITH OR WITHOUT BACKER ROD
VPR RET-4	03 3000 - 15 MIL UNDERSLAB VAPOR RETARDER
VPR RET-5	07 5300 - SELF-ADHERED ROOF DECK VAPOR RETARDER
VPR RET-10	07 2500 - SELF-ADHERED OR FLUID APPLIED VAPOR RETARDER
WD PNL-1	09 5100 - WOOD WALL PANEL

FLOOR TYPE FL2

FLOOR TAG	DESCRIPTION
FL2	RAISED ACCESS FLOOR SYSTEM - SEE FLOOR PLAN FOR EXTENTS

FLOOR TYPE FL1

FLOOR TAG	DESCRIPTION
FL1	SLAB ON GRADE - INFILL AT AREAS WHERE EXISTING SLAB WAS REMOVED TO ACCOMDOATE UNDERSLAB MEP. SEE DEMO PLANS AND MEP DRAWING FOR MORE INFO.

GYP. BD. CEILING TYPES

CEILING TAG	GYP. BD. THICKNESS	DESCRIPTION
<GYP BRD-1>		TYPICAL GYPSUM BD CEILINGS
<GYP BRD-6>	5/8"	USED IN WET AREAS

WALL TYPE 'X1'

WALL TAG	U-VALUE (PROVIDED)	U-VALUE (REQUIRED)	UL LISTING	RATING	COMMENTS
X1	--	--	--	0	ALT. 3

WALL TYPE 'ALSTOR-2'

TYPE	U-VALUE (PROVIDED)	U-VALUE (REQUIRED)	COMMENTS
ALSTOR-2			INTERIOR STOREFRONT

PARTITION TYPE 'M'

WALL TAG	SIZE	WIDTH	G.B. THK	INSUL THICK	RATING	UL NO.	COMMENTS
M8	8" CMU	0' - 7 5/8"	N/A	N/A	0	--	--
M8.1	8" CMU	0' - 7 5/8"	N/A	N/A	1	U906	--

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LICENSED ARCHITECT JENNIFER BURKE JACKSON DATE 11 04 2021 STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
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CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET G102
TYPICAL ASSEMBLIES

11/4/2021 10:16:24 AM

LIFE SAFETY LEGEND

NUMBER	ELEMENT ID NUMBER
WIDTH	EGRESS WIDTH
FACTOR	EGRESS FACTOR
CAPACITY	EGRESS CAPACITY
LOAD	EGRESS LOAD

<FCAB-1>

1 HOUR RATED CONSTRUCTION

2 HOUR RATED CONSTRUCTION

GAS AGENT FIRE SUPPRESSION AREA - SEE MECH PLANS & SPECS

OCCUPANCY SCHEDULE

AREA	OCCUPANCY CLASSIFICATION (IBC CHAPTER 3)	MAX. ALLOWABLE OCCUPANT LOAD	REMARKS
1,469 SF	A-3	182	
39,689 SF	B	533	
41,158 SF		715	

AREA SCHEDULE

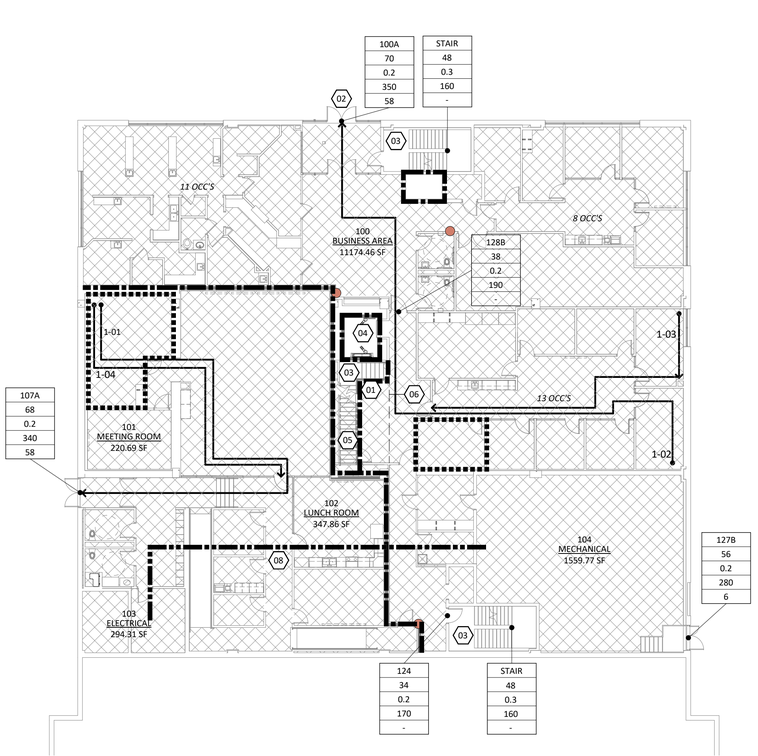
NUMBER	NAME	AREA	OCCUPANCY CLASSIFICATION (IBC CHAPTER 3)	IBC CHAPTER 10				REMARKS
				FUNCTION OF SPACE	FLOOR AREA PER OCCUPANT	SF PER OCC. MEASUREMENT	OCCUPANT LOAD MAX. ALLOWABLE OCCUPANT LOAD	
100	BUSINESS AREA	11,174 SF	B	BUSINESS AREA	150	GROSS	75	
101	MEETING ROOM	221 SF	B	ASSEMBLY - W/O FIXED SEATING - UNCONCENTRATED	15	NET	15	
102	LUNCH ROOM	348 SF	B	ASSEMBLY - W/O FIXED SEATING - UNCONCENTRATED	15	NET	24	
103	ELECTRICAL	294 SF	B	ACCESSORY STORAGE, MECH EQUIPMENT ROOM	300	GROSS	1	
104	MECHANICAL	1,560 SF	B	ACCESSORY STORAGE, MECH EQUIPMENT ROOM	300	GROSS	6	
200	BUSINESS AREA	10,825 SF	B	BUSINESS AREA	150	GROSS	73	
201A	COUNCIL CHAMBER	1,096 SF	A-3	ASSEMBLY - W/O FIXED SEATING	7	NET	157	
201B	COUNCIL CHAMBER	373 SF	A-3	ASSEMBLY - W/O FIXED SEATING - UNCONCENTRATED	15	NET	25	
202	MEETING	655 SF	B	ASSEMBLY - W/O FIXED SEATING - UNCONCENTRATED	15	NET	44	
203	MEETING	325 SF	B	ASSEMBLY - W/O FIXED SEATING - UNCONCENTRATED	15	NET	22	
300	BUSINESS AREA	8,533 SF	B	BUSINESS AREA	150	GROSS	57	
301	FUTURE BUSINESS AREA	2,853 SF	B	BUSINESS AREA	150	GROSS	20	
302	MEETING ROOM	600 SF	B	ASSEMBLY - W/O FIXED SEATING - UNCONCENTRATED	15	NET	40	
303	MEETING ROOM	539 SF	B	ASSEMBLY - W/O FIXED SEATING - UNCONCENTRATED	15	NET	36	
304	MEETING ROOM	349 SF	B	ASSEMBLY - W/O FIXED SEATING - UNCONCENTRATED	15	NET	24	
305	MEETING ROOM	224 SF	B	ASSEMBLY - W/O FIXED SEATING - UNCONCENTRATED	15	NET	15	
306	LUNCH ROOM	992 SF	B	ASSEMBLY - W/O FIXED SEATING - UNCONCENTRATED	15	NET	67	
307	MEETING ROOM	196 SF	B	ASSEMBLY - W/O FIXED SEATING - UNCONCENTRATED	15	NET	14	
		41,158 SF					715	

TRAVEL DISTANCE

Path ID	Travel Distance	Comments
1-01	122'-5"	T1017.2 - 250' MAX TRAVEL DISTANCE; A OCCUPANCY
1-02	146'-8"	T1017.2 - 250' MAX TRAVEL DISTANCE; A OCCUPANCY
1-03	72'-1"	T1006.2.1 - COMMON PATH OF EGRESS TRAVEL <100'
1-04	75'-9"	T1006.2.1 - COMMON PATH OF EGRESS TRAVEL <100'
2-01	127'-7"	T1017.2 - 250' MAX TRAVEL DISTANCE; A OCCUPANCY
2-02	118'-3"	T1017.2 - 250' MAX TRAVEL DISTANCE; A OCCUPANCY
2-03	187'-7"	T1017.2 - 250' MAX TRAVEL DISTANCE; A OCCUPANCY
2-04	37'-6"	1020.4 - 50' MAX DEAD END CORRIDOR; B OCCUPANCY, SPRINKLERED
2-05	67'-7"	T1006.2.1 - COMMON PATH OF EGRESS TRAVEL <100'
3-01	198'-11"	T1017.2 - 250' MAX TRAVEL DISTANCE; A OCCUPANCY
3-02	211'-2"	T1017.2 - 250' MAX TRAVEL DISTANCE; A OCCUPANCY
3-03	65'-0"	T1006.2.1 - COMMON PATH OF EGRESS TRAVEL <100'
3-04	87'-2"	T1006.2.1 - COMMON PATH OF EGRESS TRAVEL <100'

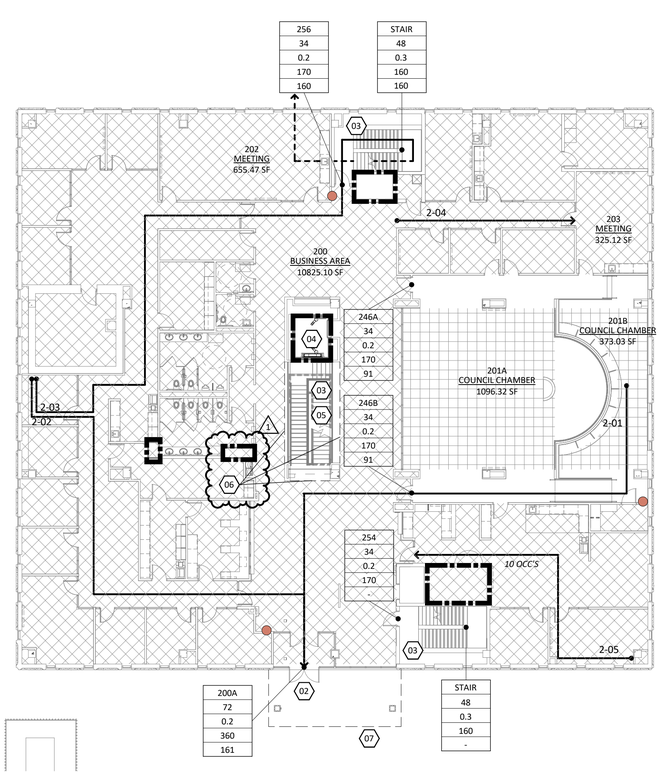
LIFE SAFETY KEYNOTES

Value	Note
01	WALLS & SOFFITS WITHIN ENCLOSED USEABLE SPACE UNDERNEATH STAIRWAYS SHALL BE PROTECTED BY 1-HR RATED CONSTRUCTION. SEE IBC 1011.7.3. SEE STAIR DETAILS FOR RATED SOFFITS AT THE UNDERSIDE OF STAIRWAY.
02	ACCESSIBLE PUBLIC ENTRANCE.
03	EXIT ACCESS STAIR: IBC 1019.3, EXCEPTION 1 - EXIT ACCESS STAIR NOT REQ'D TO BE ENCLOSED. EXIT ACCESS TRAVEL DISTANCE MUST BE MEASURED WITHIN THE STAIR.
04	1-HR FIRE BARRIER AT ELEVATOR HOISTWAY.
05	THREE STORY OPENING CONTAINING NEW EXIT ACCESS STAIR COMPLYING WITH IBC 1019.3, ITEM 4: EXIT ACCESS STAIRWAYS AND RAMPS IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, WHERE THE AREA OF THE VERTICAL OPENING BETWEEN STORIES DOES NOT EXCEED TWICE THE HORIZONTAL PROJECTED AREA OF THE STAIRWAY OR RAMP AND THE OPENING IS PROTECTED BY A DRAFT CURTAIN AND CLOSELY SPACED SPRINKLERS IN ACCORDANCE WITH NFPA 13. IN OTHER THAN GROUP B AND M OCCUPANCIES, THIS PROVISION IS LIMITED TO OPENINGS THAT DO NOT CONNECT MORE THAN FOUR STORIES.
06	DRAFT CURTAIN AND CLOSELY SPACED SPRINKLER HEADS IN ACCORDANCE WITH NFPA 13. CURTAIN BOARD TO BE 18" MIN. LOWER THAN ADJACENT CEILING. SPRINKLER HEADS TO BE 6"-12" FROM CURTAIN BOARD; SPRINKLER HEAD SPACING TO BE LESS THAN OR EQUAL TO 6' O.C. SEE CEILING DETAILS AND MEP DRAWINGS FOR MORE INFORMATION.
07	NON-SPRINKLERED WALL PROJECTION: COVERED ENTRY ALLOWED AS NON-COMBUSTIBLE CONSTRUCTION - IBC 705.2.1
08	2-HOUR FIRE-RATED CHASE FOR ELECTRICAL FEEDER BETWEEN BOILER ROOM & COMMUNICATION ROOM. OVERHEAD; SEE RCP & ELECTRICAL DRAWINGS FOR FURTHER INFORMATION.



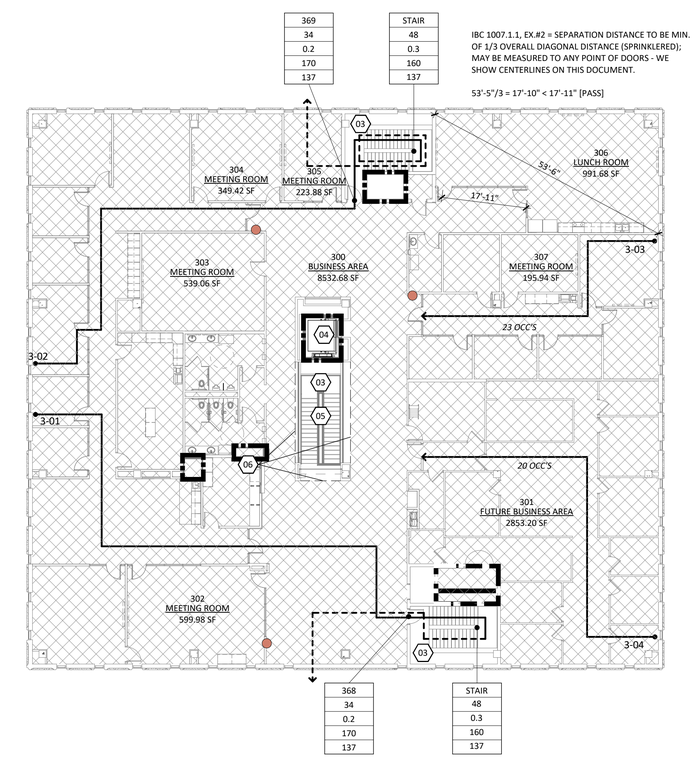
1 G110 FIRST FLOOR - LIFE SAFETY PLAN

SCALE: 1/16" = 1'-0"



2 G110 SECOND FLOOR - LIFE SAFETY PLAN

SCALE: 1/16" = 1'-0"



3 G110 THIRD FLOOR - LIFE SAFETY PLAN

SCALE: 1/16" = 1'-0"

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JENNIFER BURKE JACKSON
7369
DATE 11.04.2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	11/12/21

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466

DATE
11/04/21

PHASE
CONSTRUCTION DOCUMENTS

PROJECT
21019

SHEET
G110
LIFE SAFETY PLANS

11/12/2021 11:44:34 AM

CODE/ZONING REVIEW
JLG 21019 Minot City Hall Rehabilitation
November 3, 2021

The following review was completed by: Eric Hoffer, Nick Jensen

BUILDING STATISTICS:

Site / Lot Area:	42,010 SF
Building Areas:	
First Level:	14,698 SF
Second Level:	15,812 SF
Third Level:	15,812 SF
TOTAL	46,322 SF
Building Height:	48'-8"

ZONING / SITE REQUIREMENTS:

Zoning District:	CBD – DOWNTOWN MIXED USE LAND USE CATEGORY
Building Use:	CITY HALL
Density/FAR:	N/A
Yard Requirements (setbacks):	
Front:	N/A
Sides:	N/A
Rear:	N/A
	SEE ALSO REQUIREMENTS BASED ON CONSTRUCTION TYPES
Site Coverage Restrictions:	N/A
Height Restrictions:	N/A
Parking Requirements:	NONE
Landscaping:	MINOT LDO, SECTION 7.1-4 – SCREENING REQUIREMENTS
Possible Variances:	NONE AT THIS TIME
Other Notes / Requirements:	CITY INSPECTIONS NOTES: REVIEW INITIAL PLANS & GET FINAL APPROVAL FROM CITY ENGINEERING/INSPECTIONS [COMPLETED]; LANDSCAPE TO ADDRESS PEDESTRIANS [COMPLETED]; EXTERIOR LIGHTING TO BE SHIELDED [COMPLETED]

BUILDING CODE ANALYSIS – APPLICABLE GOVERNING CODES:

Building Code:	2018 IBC
State Amendments:	YES - https://www.communityservices.nd.gov/buildingcode/
City Amendments:	YES - https://library.municode.com/nd/minot/codes/code_of_ordinances?nodeid=COOR_CH9BUHO_ARTIBUCO
Fire Code:	2018 IFC
Mechanical Code:	2018 IMC
Energy Code:	2018 IECC (AS AMENDED BY ND)

Plumbing Code:	ND STATE PLUMBING CODE (BASED ON UPC)
Electrical Code:	NEC 2020 + ND STATE AMENDMENTS
Elevator Code:	2018 ASME A17.1
Accessibility Code:	ANSI 117.1 (2009)
Life Safety Code (NFPA):	N/A

BUILDING CLASSIFICATION AND LIMITATIONS:

Occupancy Classification(s) by Code:	A-3, B
Occupancy Separation(s): *(from Table)*	None – non-separated
Non-Separated Uses:	Yes
Incidental Use Areas (From Table)	• Furnace and boiler rooms – no rating req'd; sprinkler system • Electrical Transformer rooms – NFPA 70 for protection and rating requirements.
Automatic Sprinkler System:	To be installed as part of this project.
Standpipe System:	YES
Portable Fire Extinguishers:	Per NFPA 10 (75' radius for locations)
Construction Type:	II-B
Buildings on the Same Lot:	N/A
Maximum Allowable Area:	
Basic Limit (From Table)	28,500 SF
Allowable Area with Area Increase	*35,625 SF per floor*
For Frontage	If = [F/P - 0.25]W/30 | [480/480 – 0.25]30/30 = 0.75
Area Increase Formula	Aa = At + (NS * If) | 28,500 + (9,500* 0.75) = 35,625 SF
Maximum Allowable Heights (From Table):	
Basic Limit	75'
Height Modifications:	NONE
Is this a High Rise Classification:	No
Mixed Occupancy Area Calculation:	N/A
Special Requirements based on Occupancy:	N/A

FIRE RESTRICTIVE REQUIREMENTS:

Construction Type:	II-B
Structural frame *(From Table)*	0 HR
Roof supports	0 HR
Bearing Walls *(From Table)*	0 HR
Exterior	x HR MIN - *Not less than that required by Fire Separation Distance.* Fire Separation Distance — x Occupancy < 5 feet — x ≥ 5 feet, but < 10 feet — x ≥ 10 feet, but < 30 feet — x ≥ 30 feet — x
Interior	0HR *(See also occupancy separations and other requirements for fire-resistance ratings)*
Interior supporting Roof	0HR *(See also occupancy separations and other requirements for fire-resistance ratings)*
Nonbearing walls and partitions	0HR

Exterior	0HR *(See also occupancy separations and other requirements for fire-resistance ratings)*
Interior	0HR *(See also occupancy separations and other requirements for fire-resistance ratings)*
Floor Construction *(From Table)*	0HR
Roof Construction *(From Table)*	0HR
Exterior Walls	
Projections	30'+ = 20' FSD (NON-COMBUSTIBLE MATERIAL CONST. REQ'D)
Openings	FSD: 3'-5'=15% | 5'-10'=25% | 10'-15'=45% | 15'-20'=75% |20'+=NO LIMIT
Parapet	SAME RATING REQ'D AS SUPPORTING WALL
Fire Walls	REFER TO ASSEMBLIES FOR UL LISTING
Fire Barriers	REFER TO ASSEMBLIES FOR UL LISTING
Shaft Enclosures	FIRE BARRIER CONSTRUCTION | <4 STORY = 1 HR RATED
Elevator Lobby	N/A
Exit enclosures	N/A
Exit passageway	N/A
Horizontal exit	N/A
Atriums	NO ATRIUM CONDITION. CENTRAL STAIRS FOLLOW: 712.1.12 > 1019.3 #4 – IN BUILDINGS EQUIPPED WITH AUTOMATIC SPRINKLER SYSTEM & THE OPENING IS PROTECTED BY A DRAFT CURTAIN & CLOSELY SPACED SPRINKLERS; LIMITED TO <4 STORIES CONNECTED.
Incidental use areas	PER TABLE – IDENTIFIED ON LIFE SAFETY PLANS AS APPLICABLE
Control areas	N/A
Separation of Mixed Occs	N/A

ADDITIONAL FIRE REQUIREMENTS:

Penetrations	
Joint Systems	
Structural Members	See requirements above from Table. Shall not be less than the rating required for the fire-resistance-rated assemblies supported.
Opening Protectives	
Ducts/Transfer Openings	
Concealed Spaces	
Fireblocking:	
Draftstopping Flr/Ceiling:	Verify requirement if using NFPA 13R sprinkler system
Draftstopping in Attic:	

EGRESS REQUIREMENTS (IBC CHAPTER 10)

Occupancy:	A-3, B
Occupant Load:	715
Stair Min Width:	44"
Accessible Means of Egress	Where more than one means of egress is req'd (by Section 1015.1 or 1019.1) from any accessible space, not less than two accessible means of egress are req'd.
Exit Stairways	To be accessible means of egress, must have area of refuge
Elevators	See Code – special requirements such as standby power and area of refuge
Heights (Vert Clear)	

Ceiling Height	7'-6" (MIN)
Stair Clearance	80"
Door Clearance	80"
Stairways	
Width	44"
Headroom	80"
Max Ht between landings	12'-0"
Handrails:	34"<HANDRAIL HT<38"
Stair Run/Risers:	11" MIN RUN/7" MAX RISE
Ramps	1:12 MAX SLOPE | 1:20 OR LESS IS NOT A RAMP
Handrails	34"<HANDRAIL HT<38"
Common Path of Egress:	100' MAX
Exit Access:	NO EGRESS THRU OTHER SPACES (W/EXCEPTIONS)
Exit Access Travel Distance:	250' MAX TRAVEL DISTANCE (300' FOR 'B' OCC)

ENERGY EFFICIENCY (IBC)

See International Energy Conservation Code and local amendments. Complete necessary documentation.	
	COMCHECK AVAILABLE SHOWING BUILDING ENVELOPE COMPLIANCE

PLUMBING FIXTURE REQUIREMENTS (IBC & LOCAL CODES)

Plumbing Fixture Counts:	REQUIRED (SEE PLUMBING FIX. SPREA DSHEET)		PROVIDED
(715 OCC'S)	Men (91 'A' + 266.5 'B')	Women (91 'A' + 266.5 'B')	
Lavs (Sinks)	4 REQ'D	4 REQ'D	17 PROVIDED
Water Closets (Toilets)	7 REQ'D	7 REQ'D	15 PROVIDED
Urinals	NONE REQ'D		4
Drinking Fountains	6 REQ'D | 1 SERVICE SINK REQ'D		4 DF + 2 BOTTLE FILLER | 1 SERV. SINK

MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES

Classification	Description	Occupant Load	Water Closets (Urinals see section 424.2 of the International Plumbing Code) Male	Water Closets Female	Water Closets Required Male	Water Closets Required Female	Lavatories Male	Lavatories Female	Lavatories Required Male	Lavatories Required Female	Bathtubs/ Showers Count	Bathtubs/ Showers Required	Drinking Fountains Count	Drinking Fountains Required	Other Count	Other Required
Assembly	Theaters and other buildings for the performing arts and motion pictures	0	1 per 125	1 per 65	0	0	1 per 200		0	0	–	0	1 per 500	0	1 service sink	0
	Nightclubs, bars, taverns, dance halls and buildings for similar purposes	0	1 per 40	1 per 40	0	0	1 per 75		0	0	–	0	1 per 500	0	1 service sink	0
	Restaurants, banquet halls and food courts	0	1 per 75	1 per 75	0	0	1 per 200		0	0	–	0	1 per 500	0	1 service sink	0
	Casino gaming areas	0	1 per 100 for the first 400 and 1 per 250 for the remainer exceeding 400	1 per 50 for the first 400 and 1 per 150 for the remainder exceeding 400	0	0	1 per 250 for the first 750 and 1 per 500 for the remainder exceeding 750		0	0	–	0	1 per 1,000	0	1 service sink	0
	Auditoriums (which permanent seating, art galleries, exhibition halls, museums, lecture halls, libraries, arcades and gymnasiums	182	1 per 125	1 per 65	1	1	1 per 200		0	0	–	0	1 per 500	0	1 service sink	0
	Passenger terminals and transportation facilities	0	1 per 500	1 per 500	0	0	1 per 750		0	0	–	0	1 per 1,000	0	1 service sink	0
	Places of worship and other religious services	0	1 per 150	1 per 75	0	0	1 per 200		0	0	–	0	1 per 1,000	0	1 service sink	0
	Coliseums, arenas, skating rinks, pools and tennis courts for indoor sporing events and activities	0	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	0	0	1 per 200	1 per 150	0	0	–	0	1 per 1,000	0	1 service sink	0
	Stadiums, amusement parks, bleachers and grandstands for outdoor sporting events and activities	0	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	0	0	1 per 200	1 per 150	0	0	–	0	1 per 1,000	0	1 service sink	0
Business	Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, light industrial ambulatory care and similar uses	333	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50		4	4	1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80		4	4	–	0	1 per 100	2	1 service sink	1
Educational	Educational facilities	0	1 per 50		0	0	1 per 50		0	0	–	0	1 per 100	0	1 service sink	0
Factory and Industrial	Structures in which occupants are engaged in work fabricating, assembly or processing of products or materials	0	1 per 100		0	0	1 per 100		0	0	–	0	1 per 400	0	1 service sink	0
Institutional	Custodial care facilities	0	1 per 10		0	0	1 per 10		0	0	1 per 8	0.000	1 per 100	0	1 service sink	0
	Medical care recipients in hospitals and nursing homes	0	1 per room		0	0	1 per room		0	0	1 per 15	0.000	1 per 100	0	1 service sink	0
	Employees in hospitals and nursing homes	0	1 per 25		0	0	1 per 35		0	0	–	0	1 per 100	0	–	0
	Visitors in hospitals and nursing homes	0	1 per 75		0	0	1 per 100		0	0	–	0	1 per 500	0	–	0
	Prisons	0	1 per cell		0	0	1 per cell		0	0	1 per 15	0.000	1 per 100	0	1 service sink	0
	Reformatories, detention centers and correctional centers	0	1 per 15		0	0	1 per 15		0	0	1 per 15	0.000	1 per 100	0	1 service sink	
	Employees in reformatories, detention centers and correctional centers	0	1 per 25		0	0	1 per 35		0	0	–	0.000	1 per 100	0	–	
	Adult day care and child day care	0	1 per 15		0	0	1 per 15		0	0	0	0.000	1 per 100	0	1 service sink	0
Mercantile	Retail stores, service stations, shops, salesrooms, markets and shopping centers	0	1 per 500		0	0	1 per 750		0	0	–	0.000	1 per 1000	0	1 service sink	0
Residential	Hotels, motels, boarding houses (transient)	0	1 per sleeping unit	Residential			1 per sleeping unit		Residential		1 per sleeping unit	0	–	0	1 service sink	0
	Dormitories, fraternities, sororities and boarding houses (not transient	0	1 per 10		0		1 per 10		0		1 per 8	0.000	1 per 100	0	1 service sink	0
	Apartment house	0	1 per dwelling unit		0		1 per dwelling unit		0		1 per dwelling unit	0	–	0	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per 20 dwelling units	0 0
	One and two family dwellings and lodging houses with five or fewer guestrooms	0	1 per dwelling unit		0		1 per 10		0		1 per dwelling unit	0	–	0	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per dwelling unit	0 0
	Congregate living facilities with 16 or fewer persons	0	1 per 10		0		1 per 10		0		1 per 8	0	1 per 100	0	1 service sink	0
Storage	Structures for the storage of goods, warehouses, storehouses and freight depots, low and moderate hazard	0	1 per 100		0	0	1 per 100		0	0	–	0	1 per 1000	0	1 service sink	0
		713.5		Medical care recipients total:	0			Medical care recipients total:	0		Total:	1	Total:	1	Service sink total:	1
				Prison cell total:	0			Prison cell total:	0						Kitchen sink total:	0
				Residential Total:	0			Residential Total:	0						Washer connection total:	0
				Public total:	7	7		Public total:	4	4						

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REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE
11/04/21
PHASE
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PROJECT
21019
SHEET
G111
CODE REVIEW

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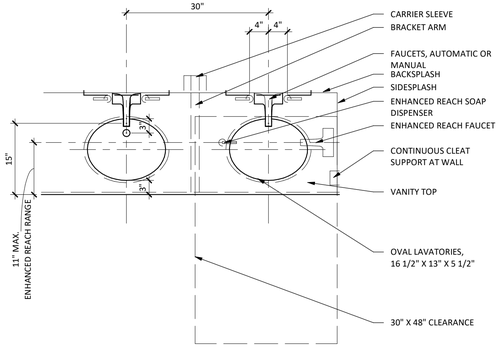

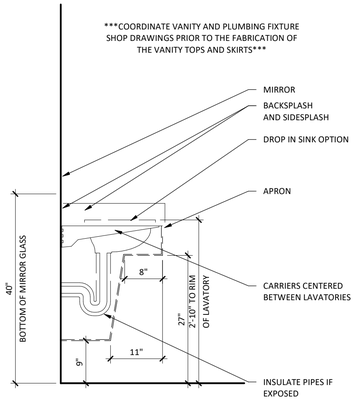

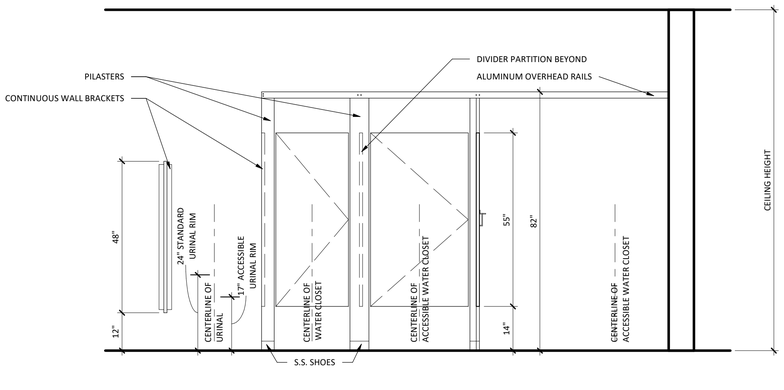

MOUNTING HEIGHT KEYNOTES

Value	Note
1	CONTROLS FOR FLUSH VALVES SHALL BE MOUNTED ON THE WIDE SIDE (ACCESSIBLE) OF TOILET AREAS NO MORE THAN 44 IN ABOVE THE FLOOR.
2	INSTALL TOILET PAPER DISPENSERS 19" TO CENTERLINE OF DISPENSER ABOVE FINISHED FLOOR. DISPENSERS THAT CONTROL DELIVERY ARE NOT PERMITTED.
3	HATCHED OR DASHED SPACE INDICATEDS REQUIRED CLEAR FLOOR SPACE.
4	DOORWAYS SHALL HAVE A MINIMUM CLEAR OPENING OF 32 IN WITH THE DOOR OPEN 90 DEGREES, MEASURED BETWEEN THE FACE OF THE DOOR AND STOP.
5	HANDLES, PULLS, LATCHES, LOCKS AND OTHER OPERATING DEVICES ON ACCESSIBLE DOORS SHALL HAVE A SHAPE THAT IS EASY TO GRASP WITH ONE HAND AND DOES NOT REQUIRE TIGHT GRASPING, TIGHT PINCHING, OR TWISTING OF THE WRIST TO OPERATE. LEVER OPERATED MECHANISMS, PUSH-TYPE MECHANISMS, AND U-SHAPED HANDLES ARE ACCEPTABLE DESIGNS.
6	GRAB BARS SHALL BE PROVIDED AT ALL ACCESSIBLE TOILET AREAS. MOUNT AT HEIGHT SHOWN AND DO NOT OBSTRUCT ANY REQUIRED CLEARANCES.
7	A CLEAR FLOOR SPACE OF 30IN BY 48IN SHALL BE PROVIDED TO ALLOW FORWARD APPROACH. URINAL SHIELDS THAT DO NOT EXTEND BEYOND THE FRONT END OF THE URINAL RIM MAY BE PROVIDED WITH 29 IN CLEARANCE BETWEEN THEM.
8	URINALS SHALL BE WALL-HUNG WITH AN ELONGATED RIM AT A MAXIMUM OF 17 IN ABOVE THE FLOOR.
9	FLUSH CONTROLS SHALL BE HAND OPERATED OR AUTOMATIC AND MOUNTED NO MORE THAN 44 IN ABOVE THE FLOOR.
10	CONTROLS
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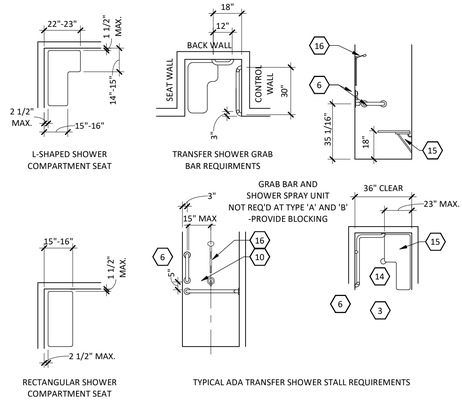
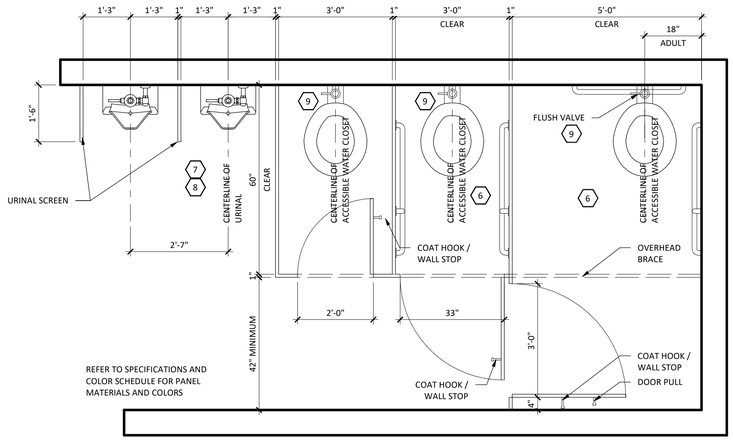
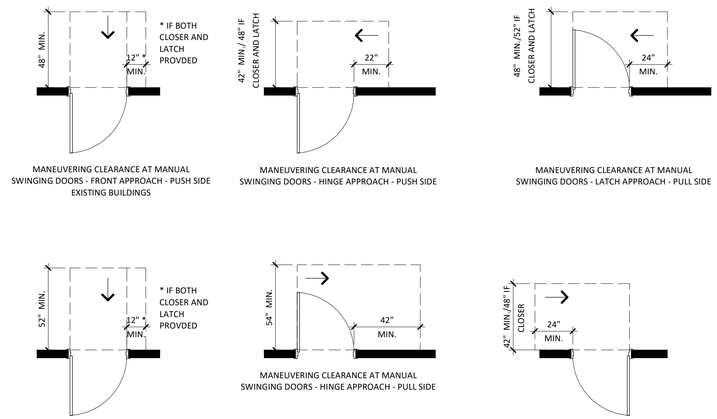
14	SHOWER STALL SIZE SHALL BE 36IN BY 36IN MINIMUM. CLEAR FLOOR SPACE SHALL BE 36IN MINIMUM IN DWELLING UNIT.
15	A SEAT SHALL BE PROVIDED IN SHOWER STALLS 36IN BY 36IN AS INDICATED ABOVE. THE SEAT SHALL BE ON THE WALL OPPOSITE THE CONTROLS. STRUCTURAL STRENGTH OF SEATS AND THE ATTACHEMENT MUST COMPLY WITH CODE.
16	A SHOWER SPRAY UNIT WITH A HOSE AT LEAST 60IN LONG THAT CAN BE USED BOTH AS A FIXED SHOWER HEAD AND AS A HAND-HELD SHOWER SHALL BE PROVIDED.

MOUNTING HEIGHTS - TYPICAL VANITIES

TOILET PARTITION ELEVATION1



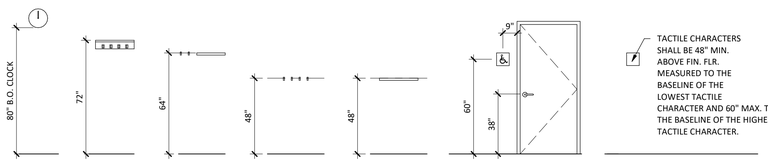


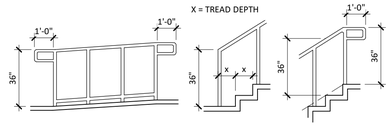


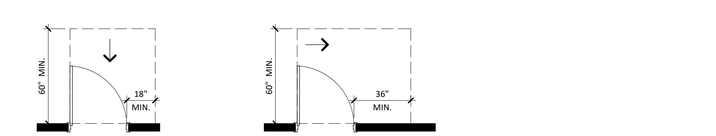
MOUNTING HEIGHTS - SHOWERS

TOILET PARTITION PLAN

DOOR CLEARANCES

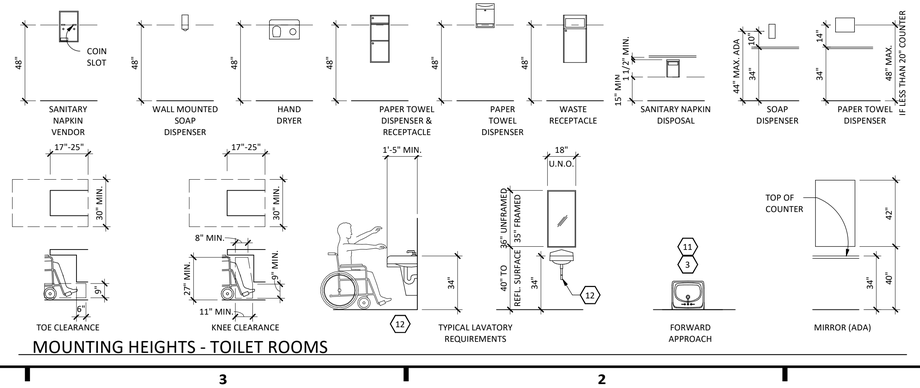






MOUNTING HEIGHTS - MISCELLANEOUS

MOUNTING HEIGHTS - RAILING EXTENSIONS



MOUNTING HEIGHTS - TOILET ROOMS

MOUNTING HEIGHTS - SHOWERS

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DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET G120
MOUNTING HEIGHTS

11/4/2021 10:16:43 AM

MOUNTING HEIGHT KEYNOTES

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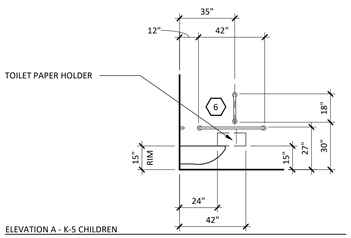
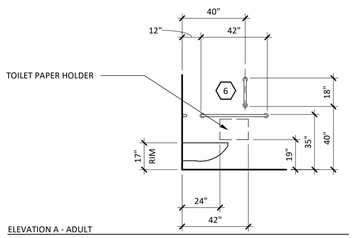
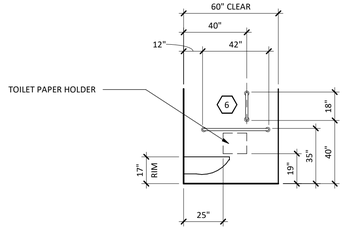
15	A SEAT SHALL BE PROVIDED IN SHOWER STALLS 36IN BY 36IN AS INDICATED ABOVE. THE SEAT SHALL BE ON THE WALL OPPOSITE THE CONTROLS. STRUCTURAL STRENGTH OF SEATS AND THE ATTACHEMENT MUST COMPLY WITH CODE.
16	A SHOWER SPRAY UNIT WITH A HOSE AT LEAST 60IN LONG THAT CAN BE USED BOTH AS A FIXED SHOWER HEAD AND AS A HAND-HELD SHOWER SHALL BE PROVIDED.



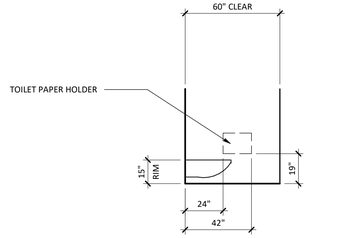
ELEVATION A - K-5 CHILDREN



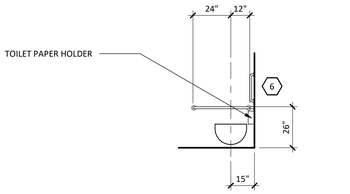
ELEVATION A - ADULT



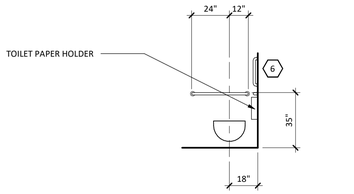
ELEVATION A - AMBULATORY



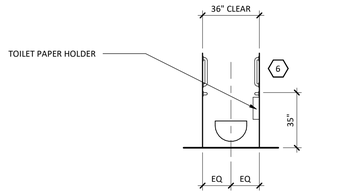
ELEVATION A - STANDARD TOILET (NON-ADA)



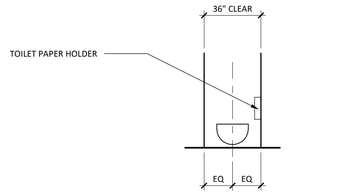
ELEVATION B - K-5 CHILDREN



ELEVATION B - ADULT

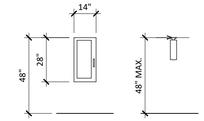


ELEVATION B - AMBULATORY



ELEVATION B - STANDARD TOILET (NON-ADA)

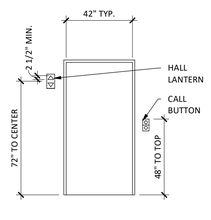
MOUNTING HEIGHTS - TOILETS AND GRAB BARS



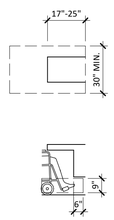
MOUNTING HEIGHT FIRE EXTINGUISHER CABINET

FIRE EXTINGUISHER

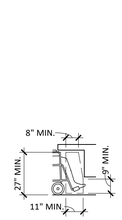
MOUNTING HEIGHTS - FIRE PROTECTION



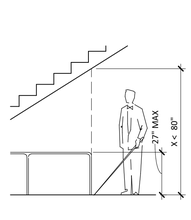
ELEVATOR ENTRANCE



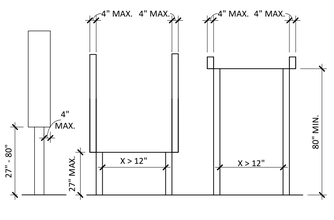
TOE CLEARANCE



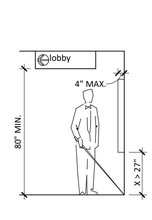
KNEE CLEARANCE



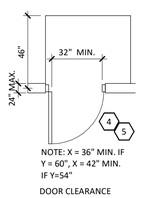
REDUCED VERTICAL CLEARANCE



POST-MOUNTED PROTRUDING OBJECTS

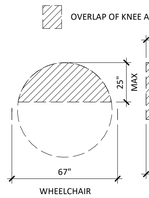


PROTRUDING OBJECTS

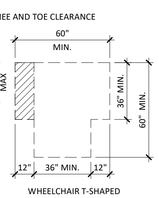


NOTE: X = 36" MIN. IF Y = 60", X = 42" MIN. IF Y=54"

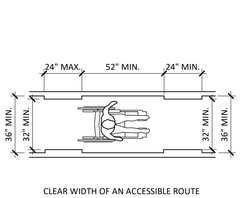
DOOR CLEARANCE



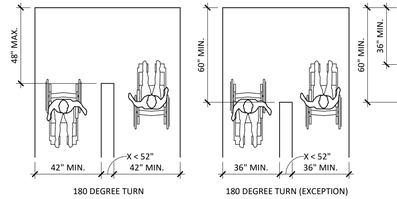
WHEELCHAIR TURNING SPACE



WHEELCHAIR T-SHAPED TURNING SPACE



CLEAR WIDTH OF AN ACCESSIBLE ROUTE



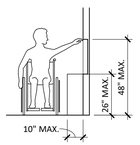
180 DEGREE TURN

180 DEGREE TURN (EXCEPTION)

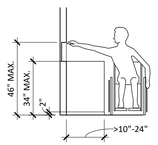
90 DEGREE TURN

CLEAR WIDTH AT TURN

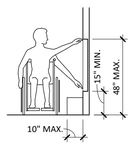
MOUNTING HEIGHTS AND HORIZONTAL CLEARANCES



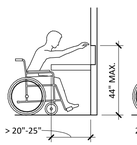
OBSTRUCTED HIGH SIDE REACH



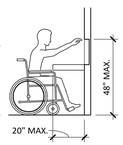
OBSTRUCTED HIGH SIDE REACH



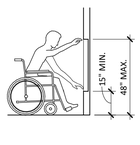
UNOBSTRUCTED SIDE REACH



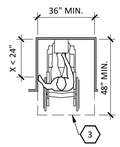
OBSTRUCTED FORWARD REACH



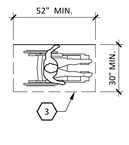
OBSTRUCTED FORWARD REACH



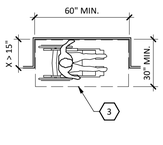
UNOBSTRUCTED FORWARD REACH



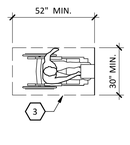
FORWARD APPROACH



PARALLEL SIDE APPROACH

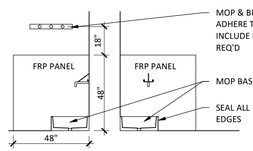


PARALLEL APPROACH

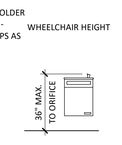


FORWARD/PARALLEL APPROACH

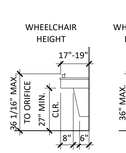
MOUNTING HEIGHTS - REACHES



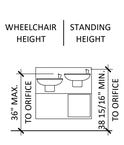
MOP ACCESSORIES



EWC OR DRINKING FOUNTAIN



TYP. ELECTRIC WATER COOLER



HIGH/LOW EWC OR DRINKING FOUNTAIN

MOUNTING HEIGHTS - MISCELLANEOUS PLUMBING

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
DATE 1 04 2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466

DATE
11/04/21

PHASE
CONSTRUCTION DOCUMENTS

PROJECT
21019

SHEET
G121
MOUNTING HEIGHTS

11/4/2021 10:16:47 AM

CIVIL ABBREVIATIONS

(OTHER ABBREVIATIONS MAY APPEAR ON DRAWINGS ASSOCIATED WITH SPECIFIC WORK)

&	- AND
∠	- ANGLE
@	- AT
℄	- CENTERLINE
°	- DEGREES
Δ	- DELTA
Ø	- DIAMETER
□	- SQUARE
±	- PLUS / MINUS
ABS	- ACRYLONITRILE-BUTADIENE-STYRENE
ACI	- AMERICAN CONCRETE INSTITUTE
ACP	- ASBESTOS CEMENT PIPE
ADD'L	- ADDITIONAL
ADDM.	- ADDENDUM
ADJ.	- ADJUSTABLE
AGGR.	- AGGREGATE
ALT.	- ALTERNATE
APPR.	- APPROACH
APPROX.	- APPROXIMATE
APPURT.	- APPURTENANCE
ARCH.	- ARCHITECT or ARCHITECTURAL
AR MH	- AIR RELEASE MANHOLE
ARV	- AIR RELEASE VALVE
ASSY.	- ASSEMBLY
ASTM	- AMERICAN SOCIETY FOR TESTING MATERIALS
AVE	- AVENUE
AVV	- AIR / VACUUM VALVE
BFV	- BUTTERFLY VALVE
BITUM.	- BITUMINOUS
BL	- BUILDING LINE
BLDG.	- BUILDING
BLK.	- BLOCK
B.O.	- BY OTHERS
BP	- BEGINNING OF PROJECT
BRG.	- BEARING
BSMT.	- BASEMENT
BVC	- BEGIN VERTICAL CURVE
C-C	- CENTER TO CENTER
C&G	- CURB AND GUTTER
CB	- CATCH BASIN
CDF	- CONTROLLED DENSITY FILL
CF	- CUBIC FEET
CI	- CAST IRON
CIP	- CAST IRON PIPE
C.I.P.	- CAST IN PLACE
CJ	- CONSTRUCTION JOINT
CL	- CENTERLINE
CMP	- CORRUGATED METAL PIPE
CO	- CLEANOUT
CONC.	- CONCRETE
CONSTR.	- CONSTRUCTION
CONT.	- CONTINUOUS
CNTRL.	- CONTROL
CSP	- CORRUGATED STEEL PIPE
CSV	- CURB STOP VALVE
CTR	- CENTER
CU	- COPPER
CY	- CUBIC YARD
DEPR.	- DEPRESSION
DTL	- DETAIL
DI or D.I.	- DUCTILE IRON
DIA.	- DIAMETER
DIM.	- DIMENSION
DIP	- DUCTILE IRON PIPE
DIST.	- DISTANCE
DR	- DRIVE
DRWY	- DRIVEWAY
DWG.	- DRAWING
E.	- EAST
E-W	- EAST TO WEST
EA.	- EACH
E.F.	- EACH FACE
EJ	- EXPANSION JOINT
ELEC.	- ELECTRICAL
ELEV.	- ELEVATION
EP	- END OF PROJECT
EQ.	- EQUAL
EVC	- END VERTICAL CURVE
E.W.	- EACH WAY
EXIST.	- EXISTING
EXP.	- EXPANSION
FDN.	- FOUNDATION
FIN.	- FINISH
FL	- FLOW LINE OR FLANGE
FLR.	- FLOOR
FM	- FORCE MAIN
FRP	- FIBERGLASS REINFORCED PLASTIC
FT.	- FOOT
G&S	- GROOVE AND SHOULDER
GA.	- GAGE
GALV.	- GALVANIZED
GR.	- GRADE
GRD.	- GROUND
GV	- GATE VALVE
H	- HATCH
HDD	- HORIZONTAL DIRECTIONAL DRILLING
HDPE	- HIGH DENSITY POLYETHYLENE
HORZ.	- HORIZONTAL
HR.	- HANDRAIL
HT.	- HEIGHT
HYD	- HYDRANT
I.D.	- INSIDE DIAMETER
I.E.	- INVERT ELEVATION
IN.	- INCH
INSUL	- INSULATION
INV.	- INVERT
JT.	- JOINT
K	- RATE OF CURVATURE
L	- LENGTH OF CURVE
LB	- POUND
LCCP	- LINED CONCRETE CYLINDER PIPE
LF	- LINEAR FEET
LVC	- LENGTH OF VERTICAL CURVE
LVL	- LEVEL
MAX.	- MAXIMUM
MECH	- MECHANICAL
MFG.	- MANUFACTURER
MH	- MANHOLE
MJ or M.J.	- MECHANICAL JOINT
MIN.	- MINIMUM
MNDOT	- MINNESOTA DEPARTMENT OF TRANSPORTATION
MTDOT	- MONTANA DEPARTMENT OF TRANSPORTATION
MTR.	- METER
N.	- NORTH
N-S	- NORTH TO SOUTH
NA	- NOT APPLICABLE
NDDOT	- NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
NPT	- NIPPLE
NTS	- NOT TO SCALE
O.C.	- ON CENTER
O.D.	- OUTSIDE DIAMETER
OH.	- OVERHEAD
OPNG.	- OPENING
OSHA	- OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PC	- POINT OF CURVATURE
PC	- PRECAST
P.C.C.	- PORTLAND CEMENT CONCRETE
PE	- POLYETHYLENE
PE or P.E.	- PLAIN END
PEP	- POLYETHYLENE PIPE
PI	- POINT OF INTERSECTION
PO	- PUSH ON
POLY	
PRV	- PRESSURE REDUCING VALVE
PSI	- POUNDS PER SQUARE INCH
PT	- POINT OF TANGENCY
PLV	- PLUG VALVE
PVC	- POLYVINYL CHLORIDE
PVI	- POINT OF VERTICAL INTERSECTION
R or RAD	- RADIUS
R.	- RISER
RCCP	- REINFORCED CONCRETE CYLINDER PIPE
RCP	- REINFORCED CONCRETE PIPE
RDL	- ROOF DRAIN LINE
RES	- RESERVOIR
REQ'D.	- REQUIRED
REQ'MTS.	- REQUIREMENTS
RJ	- RESTRAINED JOINT
S.	- SOUTH
S-N	- SOUTH TO NORTH
SAN	- SANITARY
SCH.	- SCHEDULE
SD	- STORM DRAIN
SECT.	- SECTION
SF	- SQUARE FEET
SIM.	- SIMILAR
SS	- SANITARY SEWER
SSSL	- SANITARY SEWER SERVICE LEAD
ST	- STREET
STA	- STATION
STD.	- STANDARD
STL.	- STEEL
STN. STL.	- STAINLESS STEEL
STR.	- STRUCTURAL
STRUCT	- STRUCTURAL
SUP.	- SUPPORT
SWPP	- STORM WATER POLLUTION PROTECTION
SY	- SQUARE YARD
TEMP.	- TEMPORARY
THK.	- THICK
TOC	- TOP OF CASTING
T.O.P.	- TOP OF PIPE
TOS	- TOP OF STEEL
TYP.	- TYPICAL
UON	- UNLESS OTHERWISE NOTED
USACE	- U.S. ARMY CORPS OF ENGINEERS
VCP	- VITRIFIED CLAY PIPE
VERT.	- VERTICAL
W.	- WEST
W-E	- WEST TO EAST
W/	- WITH
W/O	- WITHOUT
WM	- WATERMAIN
WRF	- WATER RECLAMATION FACILITY
WSL	- WATER SERVICE LEAD
WTF	- WATER TREATMENT FACILITY
WTP	- WATER TREATMENT PLANT
WWF	- WELDED WIRE FABRIC
WWTP	- WASTE WATER TREATMENT PLANT

CIVIL BOUNDARY LEGEND

- SECTION LINE
- PROPERTY BOUNDARY
- PROPERTY LINE / LOT LINE
- EASEMENT LINE
- R/W — RIGHT-OF-WAY
- P/E — PERMANENT EASEMENT
- C/E — CONSTRUCTION EASEMENT

CIVIL UTILITY LEGEND

EXISTING	PROPOSED	
SS	SS	SANITARY SEWER
		SANITARY MANHOLE
		SANITARY CLEANOUT
		SANITARY DROP MANHOLE
		SANITARY WYE
		SANITARY PLUG
SD	SD	STORM DRAIN PIPE
		AREA INLET
		BEEHIVE INLET
		CURB INLET
		STORM MANHOLE
		FES OUTFALL
W	W	WATER LINE
		CURB STOP
		WATER MANHOLE
		AIR RELEASE MANHOLE
		METER MANHOLE
		GATE VALVE
		BLOW-OFF HYDRANT
		FIRE HYDRANT
		AIR RELEASE HYDRANT
		BUTTERFLY VALVE
		PRESSURE REDUCING MANHOLE
		WATER CROSS
		WATER TEE
		WATER FITTING
		WATER CAP
		WATER COUPLING
		WATER REDUCER
		SADDLE

CIVIL TOPOGRAPHIC LEGEND

EXISTING	PROPOSED	
		BUILDING
X	X	FENCE, BARBED WIRE
XX	XX	FENCE, WOVEN WIRE
○ ○	●	FENCE, CHAINLINK
□ □	■	FENCE, WOOD
◇ ◇	◆ ◆	FENCE, VINYL
		TREE - GROUP
		TREE - CONIFEROUS
		TREE - DECIDUOUS
		SHRUB / BUSH
		SIGN
		MILE POST
		BORE HOLE
		RIGHT-OF-WAY MONUMENT
900	900	CONTOUR - INDEX
900	900	CONTOUR - INTERMEDIATE

CIVIL SURFACE LEGEND

EXISTING	PROPOSED	
		BITUMINOUS PAVEMENT
		CONCRETE
		GRAVEL

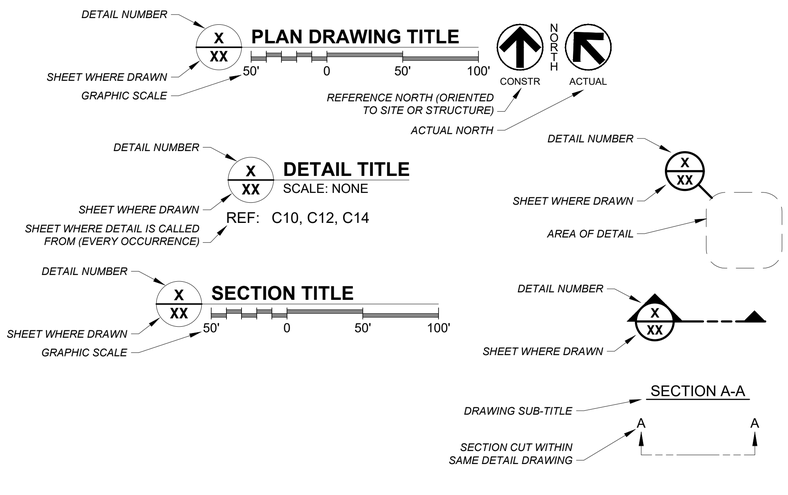
CIVIL UTILITY LEGEND CONT.

CTV	CABLE TV LINE
TV	CABLE TV PEDESTAL
	COMM LINE
T	TELEPHONE LINE
T	TELEPHONE PEDESTAL
TFO	FIBER OPTIC LINE
TFO	FIBER OPTIC PEDESTAL
G	GAS LINE
G	GAS LINE-ABANDONED
V	GAS LINE VENT
UGE	ELECTRIC, UNDERGROUND
OHE	ELECTRIC, OVERHEAD
	ELECTRIC UTILITY POLE
E	ELECTRIC BOX
	ELECTRIC MANHOLE
C	ELECTRIC GUY
	ELECTRIC LIGHT
	ELECTRIC SIGNAL ARM
	ELECTRIC SIGNAL
	ELECTRIC PUSH-TO-WALK
	UNKNOWN PEDESTAL
	UNKNOWN MANHOLE
	UNKNOWN VALVE

CIVIL DRAWING SYMBOLS

- 100.00'± FLOOR — EXISTING ELEVATION & LOCATION IN SECTION VIEW (CONTRACTOR TO VERIFY)
- 100.00'± FLOOR — EXISTING ELEVATION & LOCATION IN PLAN VIEW (CONTRACTOR TO VERIFY)
- 108.00' WALL — PROPOSED ELEVATION & LOCATION IN SECTION VIEW
- 108.00' FLOOR — PROPOSED ELEVATION & LOCATION IN PLAN VIEW
- BREAKLINE (OBJECT CONTINUES, DRAWING ENDS)
- DIRECTION OF FLOW
- 1 — EXISTING NOTES
- 1 — DEMOLITION NOTES
- 1 — CONSTRUCTION NOTES
- 1 — PIPING SCHEDULE ITEMS
- EQUIP — EQUIPMENT SCHEDULE ITEMS

DRAWING, SECTION AND DETAIL CONVENTIONS



GENERAL NOTES

1. THE INFORMATION DEPICTED WITHIN THESE DRAWINGS IS COMPLETED FROM LEGACY DRAWINGS AND FIELD SURVEYS PROVIDED BY CITY OF MINOT, SITE VISITS, CONSTRUCTION OBSERVATION TIES AND PHOTOGRAPHS, AND THE MEMORIES OF CITY STAFF AND CONSTRUCTION OBSERVERS.
2. THE LOCATIONS OF KNOWN UNDERGROUND UTILITIES ARE SHOWN ON THE CONSTRUCTION DRAWINGS IN AN APPROXIMATE WAY ONLY. ADDITIONAL ACTIVE AND INACTIVE UTILITIES MAY BE PRESENT.
3. CORDINATE ALL ON-SITE STORAGE WITH OWNER TO AVOID CONFLICTS WITH EXISTING UTILITIES.
4. MAINTAIN PUBLIC ACCESS TO ALL CITY STREETS AT ALL TIMES.
5. ALL SITE CONSTRUCTION WORK SHALL BE IN ACCORDANCE WITH THE 2019 CITY OF MINOT STANDARD SPECIFICATIONS AND DETAILS, AS REVISED.
6. COORDINATE SYSTEM: US STATE PLANE NAD-83, NORTH DAKOTA ZONE, INTERNATIONAL FEET. VERTICAL DATUM: NAVD-88
7. THE TECHNICAL REQUIREMENTS CODIFIED WITHIN THE CITY OF MINOT STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (2019) SHALL APPLY EXCEPT AS SPECIFICALLY MODIFIED ON THE PLANS, INCLUDING FIELD TESTS AND INSPECTIONS.

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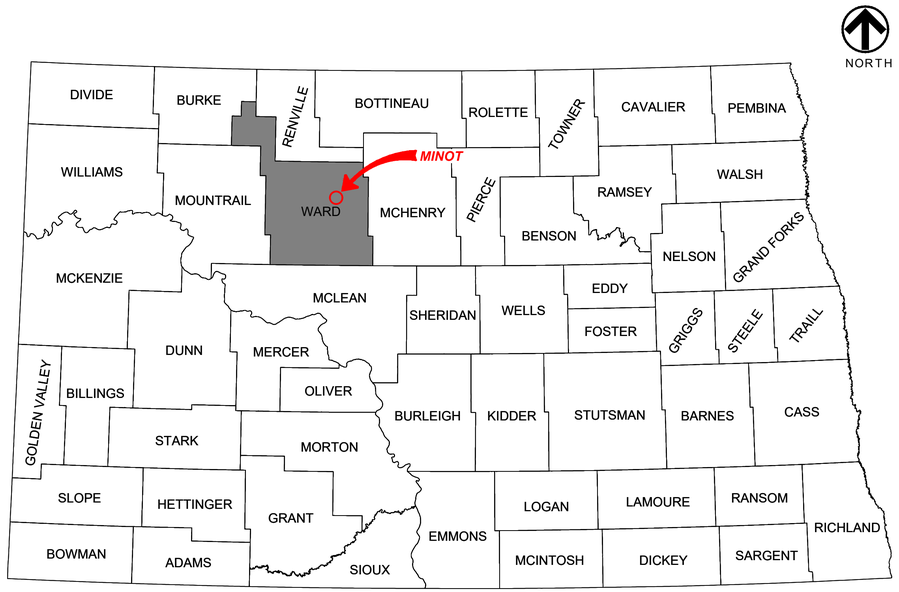
REVISION SCHEDULE

NO.	DESCRIPTION	DATE

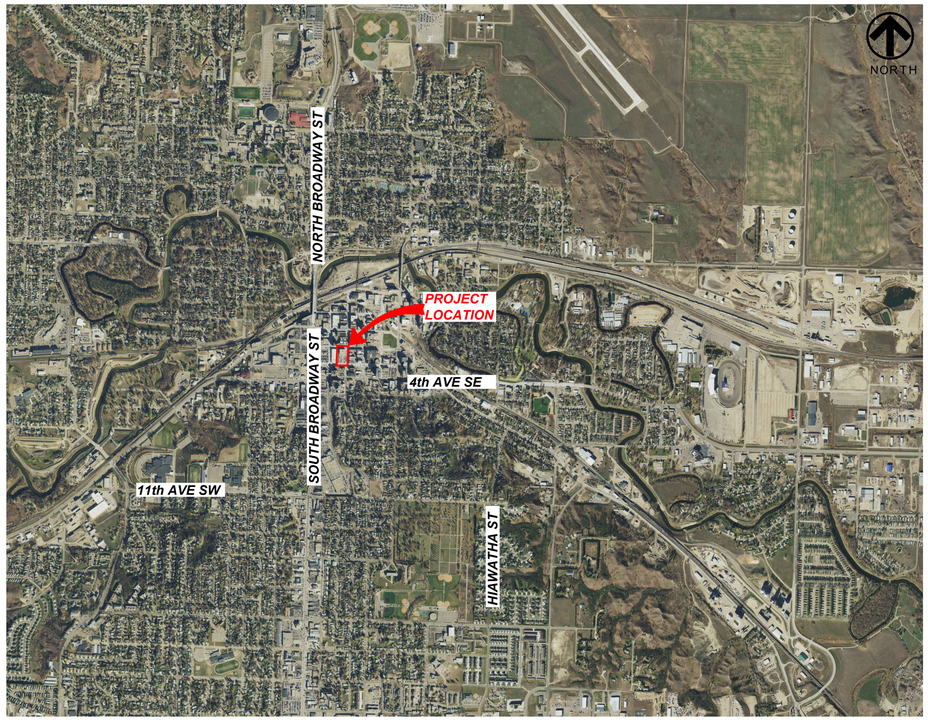
CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT P08122-2021-001
SHEET **C001**
LEGEND



STATE OF NORTH DAKOTA

1 C002 **PROJECT LOCATION MAP**
MINOT, NORTH DAKOTA



2 C002 **PROJECT VICINITY MAP**
MINOT, NORTH DAKOTA

3 C002 **PROJECT AERIAL MAP**
MINOT, NORTH DAKOTA

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REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT P08122-2021-001
SHEET C002
LOCATION MAP

CONSTRUCTION NOTES

(THESE NOTES ARE NOT ALL-INCLUSIVE. ALL WORK MUST COMPLY WITH CITY OF MINOT STANDARD SPECIFICATIONS.)

GENERAL NOTES:

1.1 CONTRACTOR SHALL BE RESPONSIBLE FOR DRAINAGE AND EROSION CONTROL DURING CONSTRUCTION AND AT PROJECT COMPLETION.

1.2 DAMAGE DUE TO CONSTRUCTION ACTIVITIES, INCLUDING BUT NOT LIMITED TO HEAVING, CONCRETE CRACKING, STREET DAMAGE, ROOT DAMAGE, SANITARY SERVICE DAMAGE, CULVERT DAMAGE, STORM SEWER DAMAGE, ETC., SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND REPAIRED AT THE CONTRACTOR'S EXPENSE.

1.3 ANY DAMAGE FROM CONSTRUCTION ACTIVITIES OUTSIDE OF THE CONSTRUCTION LIMITS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

1.4 NOT USED.

1.5 COLOR IS USED ON THESE PLANS TO DESIGNATE VARIOUS SYMBOLS AND QUANTITIES. CONTRACTOR MUST ENSURE THAT PERSONNEL WORKING ON THIS PROJECT ARE IN POSSESSION OF COLORED PLANS ONLY.

1.6 NOT USED.

1.7 MANHOLE CASTINGS AND VALVE COVERS SHALL BE COVERED AND PROTECTED DURING PAVING AND SEAL COAT OPERATIONS FROM MATERIALS THAT MAY ADHERE TO THE CASTING SURFACE.

1.8 ALL PATCH AREAS SHALL BE SAW-CUT TO PRODUCE A VERTICAL EDGE. EDGE SHALL BE TACK COATED IMMEDIATELY BEFORE PAVING.

1.9 CONTRACTOR SHALL SAW-CUT ALL CURB & GUTTER, SIDEWALK, DRIVEWAY, VALLEY GUTTER, AND PAVEMENT PRIOR TO REMOVAL.

1.10 MISCELLANEOUS ITEMS SUCH AS MAILBOXES, ROAD SIGNS, FENCES, POLES, AND CULVERTS SHALL BE PROTECTED OR REMOVED AND REPLACED BY THE CONTRACTOR AS AN INCIDENTAL TO THE CONTRACT.

1.11 CONTRACTOR SHALL LIMIT CONSTRUCTION WORK TO THE AREA BOUNDED BY THE PUBLIC SIDEWALKS OR PROPERTY LINES. IN NO CASE SHALL MATERIALS OR EQUIPMENT BE PLACED ON THE PUBLIC SIDEWALK OR ON PRIVATE PROPERTY, UNLESS WRITTEN AUTHORIZATION IS PROVIDED IN ADVANCE BY AN APPROPRIATE ENTITY.

1.12 ALL MANHOLE CASTINGS AND GATE VALVE BOXES SHALL BE ADJUSTED TO FINISHED GRADE.

1.13 CONTRACTOR SHALL CLEAN FOREIGN MATERIAL FROM MANHOLE COVERS AND VALVE BOX COVERS.

1.14 IT IS THE CONTRACTOR'S RESPONSIBILITY TO INFORM RESIDENTS AND BUSINESS OWNERS TO MOVE VEHICLES AND OF NO PARKING CONDITIONS TO ACCOMMODATE CONSTRUCTION AND CONSTRUCTION RELATED ACTIVITIES A MINIMUM OF 48 HOURS IN ADVANCE.

1.16 AN EROSION CONTROL PLAN SHALL BE PREPARED AND SUBMITTED BY THE CONTRACTOR TO THE NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY AND ENGINEER PER SPECIAL PROVISIONS BEFORE COMMENCEMENT OF WORK.

1.17 CONTRACTOR TO PROVIDE AND MAINTAIN ADEQUATE DEWATERING EQUIPMENT TO REMOVE AND DISPOSE OF ANY SURFACE AND GROUNDWATER ENTERING THE TRENCH. ALL COSTS ASSOCIATED WITH DEWATERING, SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.

1.18 THE MAXIMUM LENGTH OF OPEN TRENCH SHALL BE 200 FEET UNLESS ADDITIONAL CREWS ARE PROVIDED FOR SEPARATE LOCATIONS.

1.19 ANY EXCESS EXCAVATION SHALL BE DISPOSED OF BY THE CONTRACTOR INCIDENTAL TO THE CONTRACT.

1.20 THE LOCATIONS OF THE GEOTECHNICAL BORE HOLES INDICATED ON THE DRAWINGS ARE APPROXIMATE.

SURVEY NOTES:

1.1 COORDINATE SYSTEM: US STATE PLANE NAD 83, NORTH DAKOTA ZONE, INTERNATIONAL FEET

1.2 VERTICAL DATUM: NAVD 88

REMOVAL NOTES:

2.1 REMOVE ALL CONCRETE, ASPHALT, CURB AND GUTTER, AND SIDEWALK AS SHOWN ON THE DRAWINGS. CONTRACTOR SHALL COORDINATE REMOVAL LIMITS WITH ENGINEER IN THE FIELD.

2.2 CONTRACTOR SHALL SAW CUT FULL DEPTH ALL CURB AND GUTTER, SIDEWALK, AND PAVEMENT PRIOR TO REMOVAL.

2.3 THE CONTRACTOR SHALL PROPERLY DISPOSE OF DEBRIS RESULTING FROM CONSTRUCTION WORK, SUCH AS, BUT NOT LIMITED TO, REMOVED PIPE, MANHOLES, TREES, STUMPS, ROOTS, SOD, AND METAL PIECES, ETC. COST WILL BE INCIDENTAL TO RELATED IMPROVEMENTS.

2.4 ALL CONCRETE PAVEMENT, SIDEWALK, CURB AND GUTTER PIECES AND SOIL MATERIALS SHALL BECOME THE CONTRACTOR'S PROPERTY AND SHALL BE DISPOSED OF AND REMOVED FROM SITE.

2.5 AT INTERSECTION OF NEW PAVEMENT AND EXISTING PAVEMENT, SAW CUT PAVEMENT 5 FEET FROM FINAL REMOVAL LIMITS. SAWCUT AND REMOVE FINAL 5 FEET OF PAVEMENT JUST PRIOR TO PAVEMENT OPERATIONS.

COORDINATION NOTES:

3.1 WHEN ON THE SITE, CONTRACTOR AND EMPLOYEES SHALL PARK ALL PERSONAL VEHICLES IN THE VICINITY OF THE STAGING AREA. PERSONAL VEHICLES SHALL NOT BE PARKED ON PUBLIC STREETS INCLUDING SIDE STREETS.

3.2 CONTRACTOR WILL BE REQUIRED TO LIMIT STAGING AREAS TO THOSE AREAS AS COORDINATED IN THE FIELD BY THE ENGINEER AND THE OWNER.

3.3 DESIGNATED HAUL ROUTES SHALL BE DETERMINED BY THE CONTRACTOR IN ADVANCE AND APPROVED BY THE CITY OF MINOT ENGINEERING, THE ENGINEER, AND THE OWNER.

3.4 NOT USED.

3.5 CONTRACTOR SHALL PROVIDE ENGINEER WITH FORTY-EIGHT (48) HOURS NOTICE (EXCLUDING WEEKENDS AND HOLIDAYS) AS TO WHEN SECTIONS OF SIDEWALK AND/OR ROAD WILL BE REMOVED AND REPLACED IN FRONT OF BUILDING ACCESSES. ALL COORDINATION ACTIVITIES ARE INCIDENTAL TO THE PROJECT.

3.6 CONTRACTOR SHALL COORDINATE THE SUPPORT OF UTILITY CROSSINGS WITH UTILITY COMPANY, TRAFFIC CONTROL, AND PEDESTRIAN CROSSING ISSUES WITH THE ENGINEER AND OWNER, AND MOBILITY ISSUES WITH OTHER CONSTRUCTION SITES IN THE AREA.

3.7 CONTRACTOR SHALL MAINTAIN CONTINUOUS ACCESS TO EXISTING FACILITIES, DRIVEWAYS, AND PARKING LOTS AFFECTED BY CONSTRUCTION FOR THE DURATION OF THE CONSTRUCTION PERIOD. ALL COSTS ASSOCIATED WITH THIS ARE INCIDENTAL TO THE PROJECT.

3.8 CONTRACTOR SHALL PROVIDE A ONE (1) WEEK NOTICE TO THE CITY OF MINOT ENGINEERING, THE ENGINEER, AND THE OWNER PRIOR TO ANY ROAD CLOSURES AND CONSTRUCTION THAT AFFECTS ANY SERVICES.

3.9 COORDINATE STORAGE AND STOCKPILE SITES AND PILE SHAPING WITH THE ENGINEER AND OWNER.

UTILITY NOTES:

4.1 THE APPROXIMATE LOCATION OF KNOWN EXISTING UNDERGROUND UTILITIES ARE SHOWN ON THE PLANS. OTHER UNKNOWN UTILITIES MAY EXIST. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND SHALL BE RESPONSIBLE FOR PROTECTING ALL UTILITIES OR REPAIRING ANY DAMAGE WHICH OCCURS BECAUSE OF THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL EXISTING UTILITIES. NOT ALL OVERHEAD UTILITIES ARE SHOWN ON THE PLANS.

4.2 CONTRACTOR SHALL CALL THE NORTH DAKOTA ONE CALL (1-800-795-0555) TO LOCATE UNDERGROUND FACILITIES PRIOR TO ANY EXCAVATION.

4.3 UTILITY APPURTENANCES SHALL BE ADJUSTED AND/OR REMOVED BY RESPECTIVE UTILITY COMPANIES. UTILITY COMPANIES SHALL BE CONTACTED BY CONTRACTOR TO COORDINATE ADJUSTMENTS.

PIPELINE INSTALLATION NOTES:

5.1 ALL INSTALLED WATERMAIN, SANITARY SEWER, AND STORM SEWER SHALL BE FREE OF DEBRIS. CONTRACTOR TO CLEAN PIPES PRIOR TO INSTALLATION.

5.2 CONTRACTOR SHALL VERIFY THE LOCATION, ELEVATION, SIZE, AND MATERIAL OF THE EXISTING UTILITIES AT POINTS OF CONNECTION AND SHALL USE APPROPRIATE MATERIALS TO MAKE CONNECTION.

5.3 CONTRACTOR SHALL HOLE CORE EXISTING CONCRETE OR MANHOLE WALLS WHERE PIPE PENETRATIONS ARE REQUIRED.

5.4 CONTRACTOR SHALL VERIFY THE LOCATION, ELEVATION, SIZE, AND MATERIAL OF THE EXISTING STORM SEWER PIPE, INLETS, AND MANHOLES AT THE POINTS OF CONNECTION AND USE APPROPRIATE MATERIALS TO MAKE CONNECTION.

5.5 CONTRACTOR SHALL VERIFY THE LOCATION, SIZE, AND MATERIAL OF THE EXISTING SANITARY SEWER MAINS AND LEADS AT THE POINTS OF CONNECTION. APPROVED COUPLINGS SHALL BE USED TO MAKE CONNECTIONS AFTER VERIFICATION. RECONNECTION OF SANITARY SEWER MAINS AND SERVICE LEADS SHALL BE INCIDENTAL TO PIPELINE INSTALLATION.

5.6 CONTRACTOR SHALL MAINTAIN SANITARY SEWER SERVICE AT ALL TIMES DURING CONSTRUCTION.

5.7 ALL PIPING SHALL BE INSTALLED TO THE LINES AND GRADES AS SHOWN ON THE CONSTRUCTION DRAWINGS.

PAVEMENT REPLACEMENT NOTES:

6.1 DRIVEWAY SECTIONS SHALL CONSIST OF 6-INCH CONCRETE FOR FULL WIDTH OF SIDEWALK AS SHOWN ON PLANS.

6.2 EXPANSION JOINTS SHALL BE PLACED ALONG ALL NEW SIDEWALK, AT CURB RAMPS, DRIVEWAYS, AND INTERSECTIONS.

TRAFFIC NOTES:

7.1 A TRAFFIC CONTROL PLAN MUST BE SUBMITTED AND APPROVED BY THE ENGINEER AND CITY PRIOR TO PLACING ANY TRAFFIC CONTROL DEVICES.

7.2 CONTRACTOR WILL GIVE THE ENGINEER A MINIMUM OF SEVEN (7) DAYS NOTICE PRIOR TO PLACING TRAFFIC CONTROL SIGNS FOR UNDERGROUND CONSTRUCTION.

7.3 CONTRACTOR SHALL MINIMIZE DISRUPTION OF TRAFFIC ON STREETS AND SIDEWALKS DURING THE ENTIRE CONSTRUCTION PERIOD.

7.4 CONTRACTOR SHALL FOLLOW THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) STANDARDS AND GUIDES FOR TRAFFIC CONTROL FOR STREET AND HIGHWAY CONSTRUCTION.

PROTECTION NOTES:

8.1 THE SITE SHALL BE SECURED TO PREVENT PEDESTRIAN AND VEHICULAR TRAFFIC FROM ENTERING THE SITE, YET ALLOW PEDESTRIAN TRAFFIC TO HOMES.

8.2 DURING CONSTRUCTION, BARRIERS SHALL BE PLACED ALONG ALL SIDES OF THE TRENCH. PROVIDE BARRIERS AROUND EXCAVATIONS WHILE MAINTAINING ACCESS TO SITE. CONTRACTOR TO MINIMIZE LENGTH OF OPEN TRENCH. NO OPEN TRENCH SHALL BE LEFT UNATTENDED. ALL TRENCHES TO BE BACKFILLED OR PROTECTED WITH FENCE PRIOR TO THE END OF EACH WORKDAY.

EXCAVATION AND BACKFILLING NOTES:

9.1 CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING OSHA STANDARDS FOR EXCAVATION AND TRENCHING.

9.2 EXCAVATED SOIL FOR BACKFILL SHALL BE PLACED IN AN AREA COORDINATED WITH THE ENGINEER AND OWNER. EXCESS EXCAVATED SOIL SHALL BE DISPOSED OF BY THE CONTRACTOR AS DESCRIBED IN THE SPECIFICATIONS. COSTS SHALL BE INCIDENTAL TO TRENCHING AND BACKFILLING.

9.3 COMPACTION OF TRENCH SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.

RESTORATION NOTES:

10.1 THE CONTRACTOR SHALL KEEP ALL STREETS, ALLEYS, AND SIDEWALKS FREE FROM MATERIAL AND DEBRIS.

10.2 CONTRACTOR SHALL CLEAN STREETS, DRIVEWAYS, INTERSECTIONS, ETC. AFFECTED BY CONSTRUCTION ACTIVITIES INSIDE OR OUTSIDE OF CONSTRUCTION LIMITS DURING CONSTRUCTION PERIOD ON A DAILY BASIS. CONTRACTOR SHALL CLEAN PAVEMENTS TO THE CONDITION THEY WERE IN PRIOR TO THE START OF CONSTRUCTION AND PRIOR TO REOPENING LANE PORTIONS TO TRAFFIC.

10.3 CONTRACTOR TO PROVIDE CONCRETE TRUCK WASH OUT AREA AT SITE EXIT. CLEAN UP AND REMOVE WASH OUT DEBRIS FROM THE SITE ON A WEEKLY BASIS OR SOONER AS REQUIRED.

10.4 CONTRACTOR SHALL EXCAVATE TOP SOIL TO EXISTING DEPTH AND SHALL PLACE IN AN AREA COORDINATED WITH THE ENGINEER AND OWNER. IF SUFFICIENT TOPSOIL ISN'T AVAILABLE FOR RESTORATION, CONTRACTOR SHALL FURNISH AND PAY FOR ADDITIONAL TOPSOIL FROM BORROW SOURCES.

10.5 RESTORATION SHALL BE COMPLETED IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS.

10.6 AMERICANS WITH DISABILITIES ACT (ADA): PROVIDE TACTILE WARNING SURFACES WHICH COMPLY WITH THE DETECTABLE WARNINGS ON WALKING SURFACES SECTION OF THE AMERICANS WITH DISABILITIES ACT (TITLE 49 CFR TRANSPORTATION, PARK 37.9 STANDARDS FOR ACCESSIBLE TRANSPORTATION FACILITIES, APPENDIX A, SECTION 4.29.2 DETECTABLE WARNINGS ON WALKING SURFACES). WARNING PANELS SHALL BE CAST IRON FOR APPLICATION IN CONCRETE CURB RAMPS. CAST IRON PLATES SHALL BE FACTORY COATED IN A COLOR DETERMINED BY THE ENGINEER.

A. DETECTABLE WARNING PANEL SHALL INCLUDE THE COST OF ALL MATERIALS AND LABOR TO INSTALL A CAST IRON DETECTABLE WARNING PANEL IN THE CURB RAMP AS SHOWN ON THE DETAIL.

B. FOLLOWING IS AN APPROVED SUPPLIER LIST FOR DETECTABLE WARNING PANELS.
1. NEENAH FOUNDRY COMPANY
2. APPROVED EQUAL

C. THE DETECTABLE WARNING PANELS SHALL HAVE A MINIMUM SIZE OF 2'x2'. THE PANELS SHALL BE FACTORY COATED BLACK IN COLOR THROUGHOUT THE PANEL AND CONSIST OF A SURFACE OF TRUNCATED DOMES ALIGNED IN A SQUARE GRID PATTERN.

D. DOME SIZE - TRUNCATED DOMES IN A DELECTABLE WARNING SHALL HAVE A BASE DIAMETER OF 0.9-INCH MINIMUM TO 1.4 INCHES MAXIMUM, A TOP DIAMETER OF 50% OF THE BASE MAXIMUM, AND A HEIGHT OF 0.2 INCHES.

E. DOME SPACING - TRUNCATED DOMES IN A DETECTABLE WARNING SURFACE SHALL HAVE A CENTER TO CENTER SPACING OF 1.6 INCHES MINIMUM AND 2.4 INCHES MAXIMUM AND BASE-TO-BASE SPACING OF 0.65 INCHES MINIMUM MEASURED BETWEEN THE MOST ADJACENT DOMES ON THE SQUARE GRID.

REGISTERED PROFESSIONAL ENGINEER
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REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

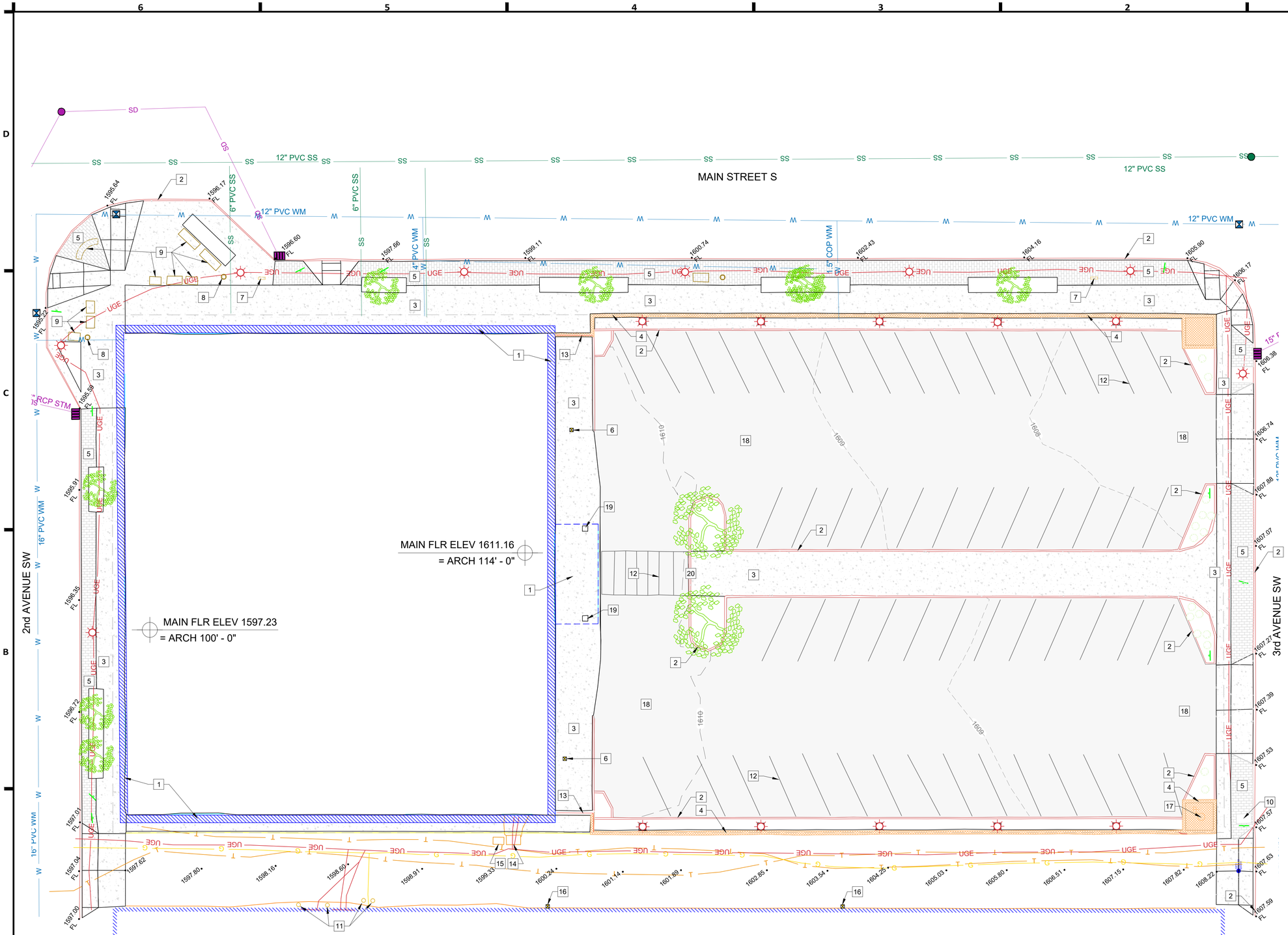
CITY PROJECT 4466

DATE
11/04/21

PHASE
CONSTRUCTION DOCUMENTS

PROJECT
P08122-2021-001

SHEET
C003
CONSTRUCTION NOTES



NORTH

0 15
Scale in Feet

EXISTING NOTES

1	ENTRY CANOPY (ABOVE)
2	CONCRETE CURB AND GUTTER
3	CONCRETE SIDEWALK
4	CONCRETE RETAINING WALL
5	STAMPED DECORATIVE CONCRETE
6	GAS VALVE
7	BICYCLE RACK
8	TRASH CAN
9	BENCH
10	CATV VAULT
11	BOLLARD
12	STRIPING
13	HAND RAIL
14	FIBER OPTIC VAULT
15	SRT VAULT
16	VALVE COVER
17	FLAG POLE
18	ASPHALT PAVEMENT
19	CANOPY COLUMNS
20	EXISTING RAMP

EXISTING LEGEND

- UNDERGROUND NGAS, NGAS VALVE
- UNDERGROUND TELEPHONE
- UNDERGROUND ELECTRIC
- WATERMAIN, VALVE, HYDRANT
- SANITARY SEWER, SS MANHOLE
- STORM SEWER, SD MANHOLE, CATCH BASIN
- POLE, LIGHTING FIXTURE
- POLE SIGN
- SHRUB / PLANTINGS
- TREE
- 1610 EXISTING MAJOR CONTOUR
- 1609 EXISTING MINOR CONTOUR
- 1600.50 FL SPOT ELEVATION

REGISTERED PROFESSIONAL ENGINEER
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CITY HALL REHABILITATION

CITY OF MINOT
MINOT, ND

CITY PROJECT 4466

DATE
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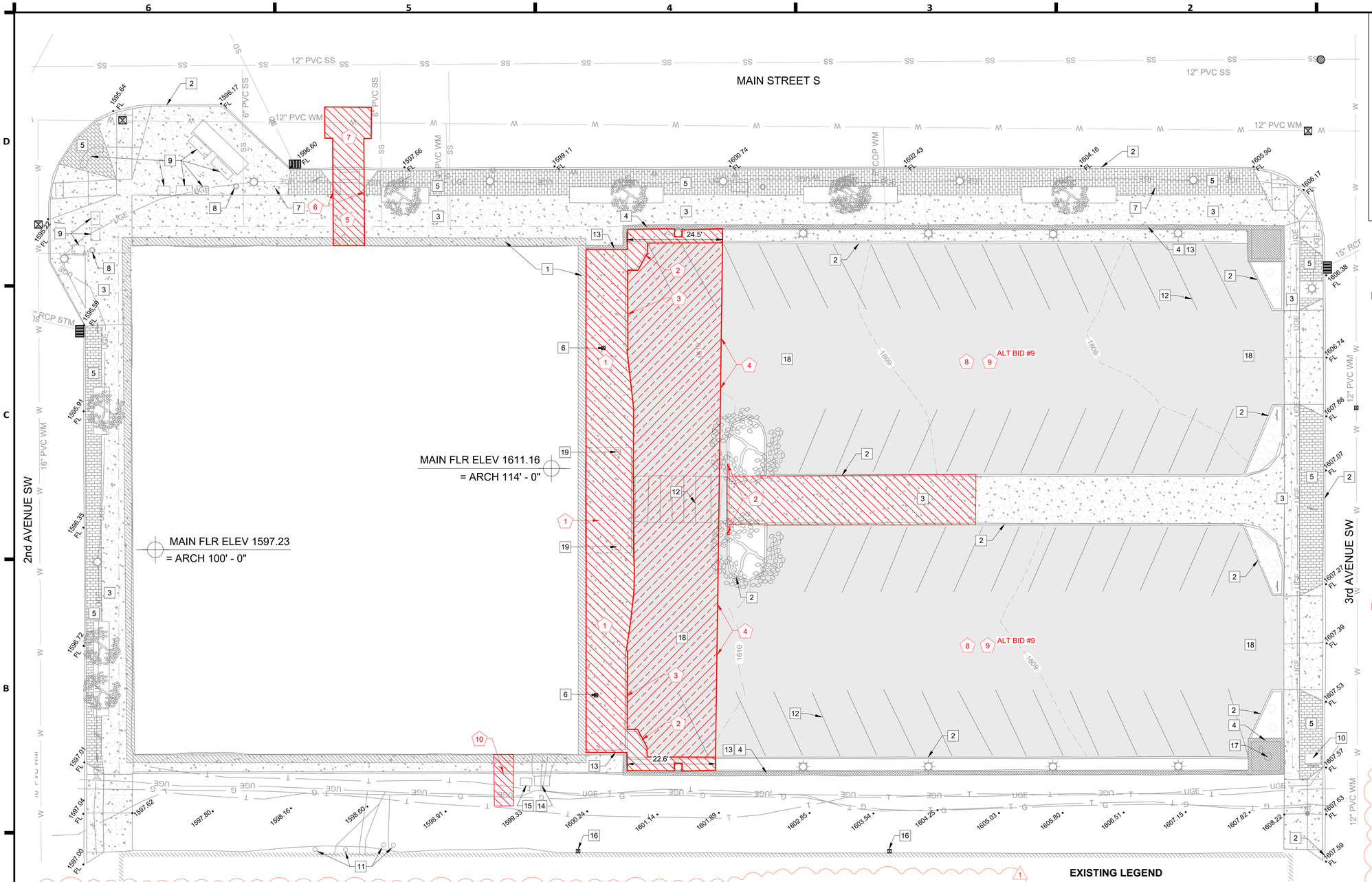
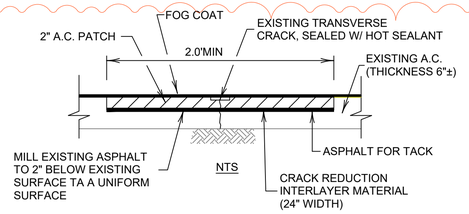
PROJECT
P08122-2021-001

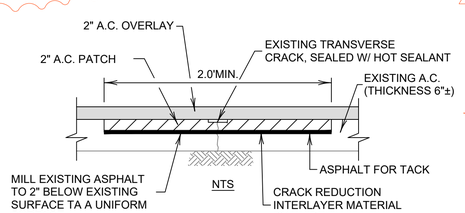
SHEET
C100
EXISTING CONDITIONS





NOTES
1. PROVIDE MILLING AND CRACK REDUCTION INTERLAYER MATERIAL CENTERED OVER TRANSVERSE CRACK AT LOCATIONS DIRECTED BY THE ENGINEER.

1 C101 2" A.C. CRACK REPAIR TYPICAL SECTION
BASE BID



NOTES
1. PROVIDE MILLING AND CRACK REDUCTION INTERLAYER MATERIAL CENTERED OVER TRANSVERSE CRACK AT LOCATIONS DIRECTED BY THE ENGINEER.

2 C101 2" A.C. CRACK REPAIR TYPICAL SECTION
ALT BID #9

NORTH

0 15
Scale in Feet

EXISTING NOTES

1. ENTRY CANOPY (ABOVE)
2. CONCRETE CURB AND GUTTER
3. CONCRETE SIDEWALK
4. CONCRETE RETAINING WALL
5. STAMPED DECORATIVE CONCRETE
6. GAS VALVE
7. BICYCLE RACK
8. TRASH CAN
9. BENCH
10. CATV VAULT
11. BOLLARD
12. STRIPING
13. HAND RAIL
14. FIBER OPTIC VAULT
15. SRT VAULT
16. VALVE COVER
17. FLAG POLE
18. ASPHALT PAVEMENT
19. CANOPY COLUMNS

DEMOLITION NOTES

1. REMOVE ENTIRE SOUTH SIDEWALK, RETAIN EXISTING STOOPS.
2. REMOVE CURB AND CONCRETE PAD.
3. REMOVE CURB.
4. SAWCUT EXISTING ASPHALT PAVEMENT ALONG A STRAIGHT LINE.
5. REMOVE EXISTING SIDEWALK FOR NEW FIRE SUPPRESSION TO NEAREST JOINT.
6. REMOVE EXISTING PAVERS AND PROTECT FOR REINSTALLATION. REMOVE CONCRETE SUPPORT SLAB.
7. REMOVE EXISTING CONCRETE CURB AND GUTTER AND PAVEMENT TO NEAREST JOINTS.
8. PREPARE EXISTING CRACKS BY MILLING AND ROUTING AND PLACEMENT OF CRACK REDUCTION INTERLAYER (PETROMAT 4599 BY PROPEX). APPLY TACK COAT AT 0.10 GAL/SY. SEE DETAIL 1/C101. APPROXIMATELY 740 LF - BASE BID. CRACKS WILL BE MARKED BY OWNER AND ARCHITECT AT TIME OF CONSTRUCTION.
9. MILL ENTIRE ASPHALT SURFACE 2", AND PREPARE 740 LF OF EXISTING CRACKS FOR REPAIR. PLACE CRACK REDUCTION FABRIC OVER 740 LF OF CRACKS BEFORE PLACING THE OVERLAY. APPLY TACK COAT AT 0.10 GAL/SY. SEE DETAIL 2/C101. - ALTERNATE BID #9
10. REMOVE EXISTING CONCRETE AND ASPHALT AS NEEDED TO INSTALL GAS UTILITY CONNECTION AT ALLEY LEVEL.

EXISTING LEGEND

- PROPERTY LINE
- G — UNDERGROUND NGAS, NGAS VALVE
- T — UNDERGROUND TELEPHONE
- UGE — UNDERGROUND ELECTRIC
- W — WATERMAIN, VALVE, HYDRANT
- SS — SANITARY SEWER, SS MANHOLE
- SD — STORM SEWER, SD MANHOLE, CATCH BASIN
- POLE, LIGHTING FIXTURE
- POLE SIGN
- SHRUB / PLANTINGS
- TREE
- 1610 — EXISTING MAJOR CONTOUR
- 1609 — EXISTING MINOR CONTOUR
- 1600.50 FL — SPOT ELEVATION

DEMO LEGEND

- REMOVE CONCRETE SIDEWALK/PAVEMENT
- REMOVE BITUMINOUS PAVEMENT
- REMOVE TREE/PLANTING
- ABANDON EXISTING UTILITY
- REMOVE EXISTING UTILITY
- CONST LIM — CONSTRUCTION LIMITS

SHEET RE-ISSUED BY ADDENDUM 1

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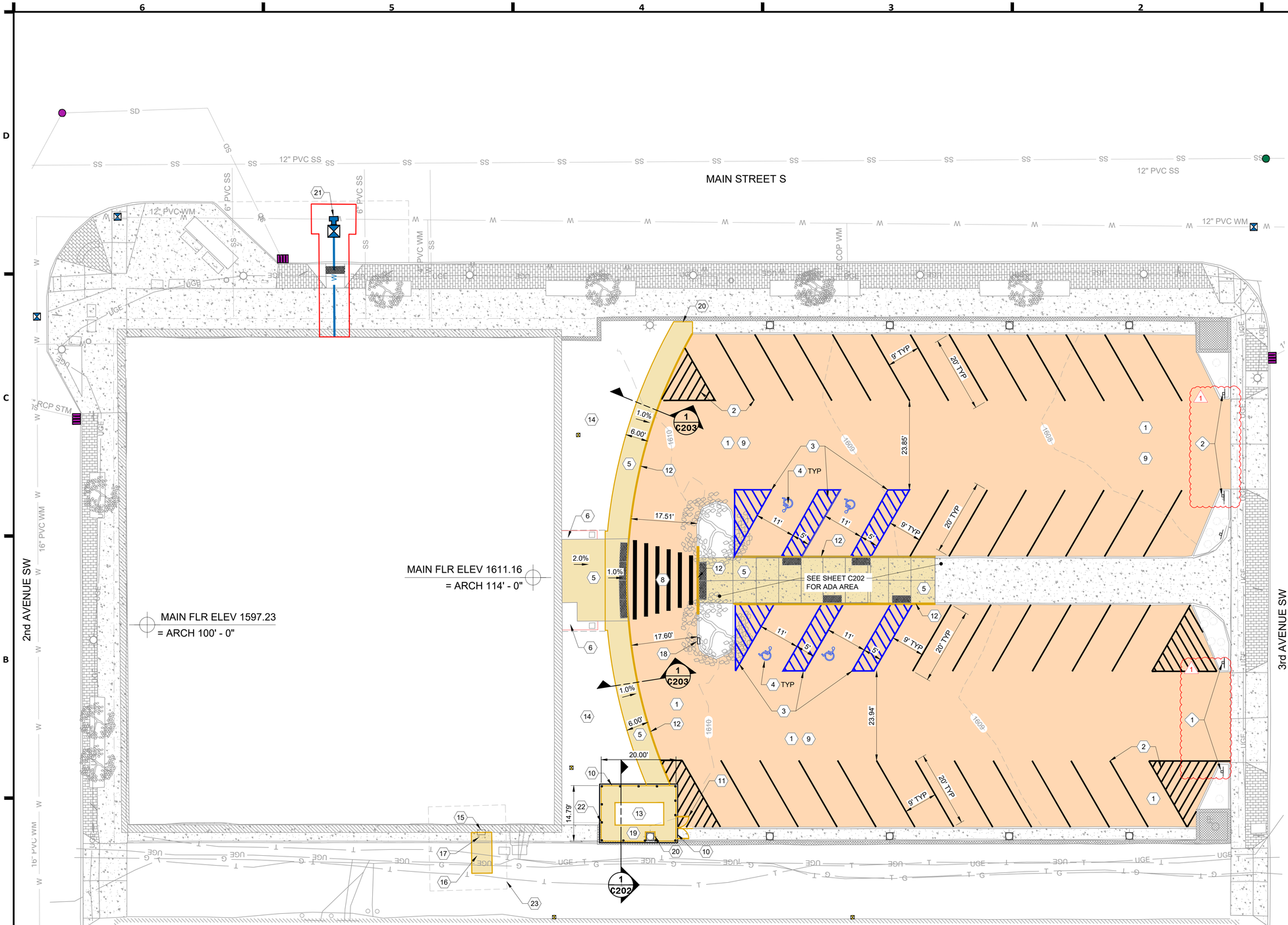
REVISION SCHEDULE		
NO.	DESCRIPTION	DATE
1	ADD#1	11/12/21

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT P08122-2021-001
SHEET C101
DEMOLITION PLAN



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NORTH

0 15
Scale in Feet

CONSTRUCTION NOTES

1. FOG SEAL ASPHALT PARKING LOT AFTER MARKED CRACKS ARE PREPARED. (BASE BID). MILL AND OVERLAY IS ALTERNATE-9.
2. WHITE 4" STRIPING.
3. BLUE 4" STRIPING.
4. BLUE ACCESSIBLE MESSAGE.
5. 5" CONCRETE SIDEWALK REINFORCED WITH No.4 DEFORMED BAR AT 16" O/C PLACED MID-SLAB.
6. CONCRETE STOOP AND GRADE BEAM. (SEE STRUCTURAL)
7. NOT USED THIS SHEET.
8. 12" WIDE WALKWAY STRIPING.
9. 2" OVERLAY ACROSS ENTIRE SURFACE, NO FOG SEAL. (ALTERNATE BID #9)
10. 10' TALL DECORATIVE ENCLOSURE
11. 6'-0" WIDE GATE DOUBLE SWING GATE. SEE ARCHITECTURAL SHEET A151.
12. THICKENED EDGE SIDEWALK CURB.
13. GENERATOR PAD. PROVIDE ½" ISOLATION JOINTS AROUND PERIMETER. SEE 1/C202 AND ELECTRICAL PLANS.
14. LANDSCAPE BEDS - SEE LANDSCAPE PLANS
15. NEW GAS METER, PROVIDED BY UTILITY SCHEDULED BY CONTRACTOR. (SEE MECHANICAL PLANS)
16. RESTORE PAVEMENT, 6" CONCRETE ON 8" AGGREGATE BASE.
17. RESTORE CONCRETE SIDEWALK AND THICKENED EDGE CURB. EXTENT AS NEEDED.
18. UTILITY PAYMENT DROP BOX - BY OWNER.
19. 5" SIDEWALK SLAB REINFORCED WITH #4 BAR AT 12" OC, THICKENED EDGE AT PERIMETER. SEE 1/C202 , STANDARD SIDEWALK SURFACE FINISH.
20. ½" ISOLATION JOINT AROUND EXISTING PIER. RE: 1/C202
21. CONNECT TO WATERMAIN PER CITY OF MINOT STANDARD SPECIFICATIONS. SEE CIVIL SHEET C203 FOR DETAILS.
22. FLUSH MOUNTED STEEL EMBED PLATE WITH HSS 4x4x¼ SCREEN WALL POST. RE: 3/C202
23. CONTRACTOR TO PREPARE A TRAFFIC CONTROL PLAN FOR APPROVAL PRIOR TO BEGINNING THE WORK.

SIGNAGE SCHEDULE

MARK	SAMPLE	DESIGNATION	SIZE	QUANT
1		R5-1	30"x30"	2
2	ENTRANCE ONLY		30"x15"	2

CONTRACTOR NOTES

1. 740 LF OF MILLED CRACK REPAIR NOT SHOWN, WILL BE FIELD IDENTIFIED BY ARCHITECT/ENGINEER. ALT BID #9

CONSTRUCTION LEGEND

- PARKING STRIPE - 4" WHITE
- PARKING STRIPE - 4" BLUE
- ACCESSIBLE PARKING HATCH - 4" BLUE
- 5" CONCRETE SIDEWALK
- THICKENED EDGE SIDEWALK CURB
- POST MOUNTED SIGN. RE 2/C203

SHEET RE-ISSUED BY ADDENDUM 3

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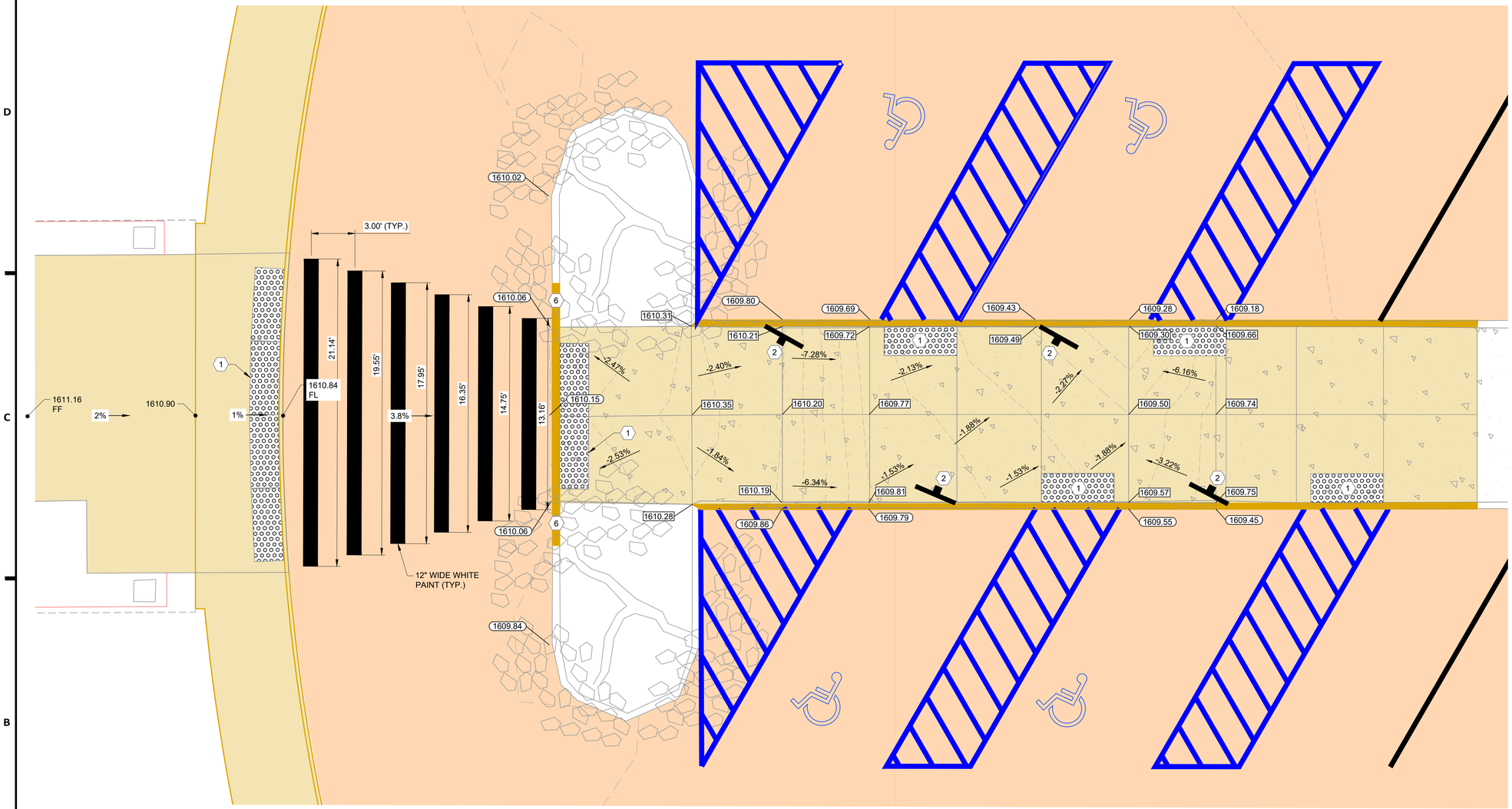
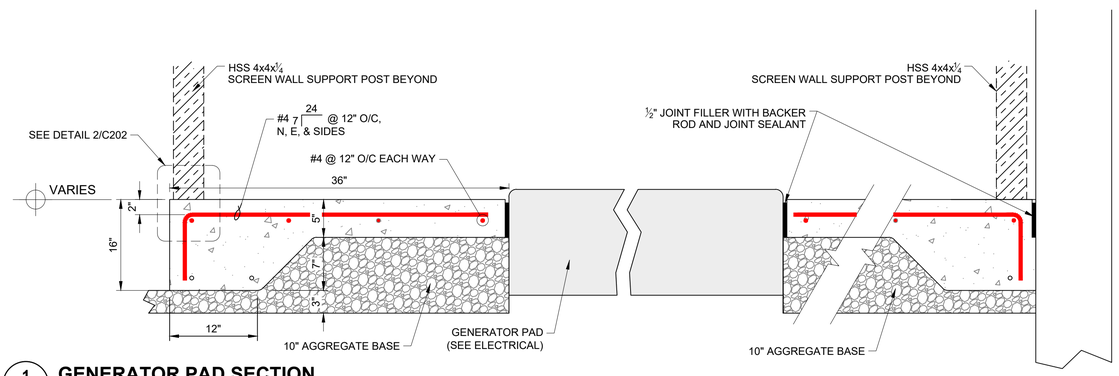
REVISION SCHEDULE

NO.	DESCRIPTION	DATE
1	ADDENDUM #3	11/24/21

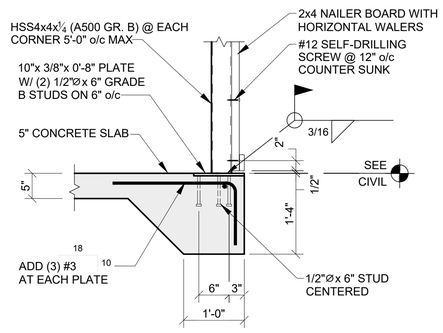
CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT P08122-2021-001
SHEET C201
LOT SURFACING & STRIPING

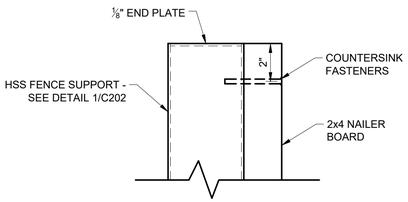




1 C202 GENERATOR PAD SECTION
NTS



2 C202 SCREEN POST SECTION
NTS



3 C202 TOP OF SCREEN POST
NTS

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NORTH

0 4
Scale in Feet

CONSTRUCTION NOTES

1. CAST IRON, INTEGRAL ANCHORED ADA RAMP WITH ADA TRUNCATED DOME PANELS.
2. ADA PARKING STALL SIGNAGE
VAN ACCESSIBLE AND UNAUTHORIZED PARKING MANDATES $100 FINE SIGN. LOCATE SIGN CENTER OF STALL, 18" BEHIND FACE OF CURB. 1
3. NOT USED THIS SHEET
4. THICKENED EDGE SIDEWALK CURB RE: 1/C203
5. 5" CONCRETE SIDEWALK REINFORCED WITH No.4 DEFORMED BAR AT 16" O/C PLACED MID-SLAB.
6. 3' CURB TAPERS.

CONSTRUCTION LEGEND

- PARKING STRIPE - 4" WHITE
- PARKING STRIPE - 4" BLUE
- ACCESSIBLE PARKING HATCH - 4" BLUE
- 5" CONCRETE SIDEWALK
- THICKENED EDGE SIDEWALK CURB RE: 1/C203

CONTRACTOR NOTES

1. CONTRACTOR TO FOLLOW ALL ADA REQUIREMENTS INCLUDING TRUNCATED DOMES AND SIDEWALK SLOPES.

REVISION SCHEDULE

NO.	DESCRIPTION	DATE
1	ADDENDUM #3	11/24/21

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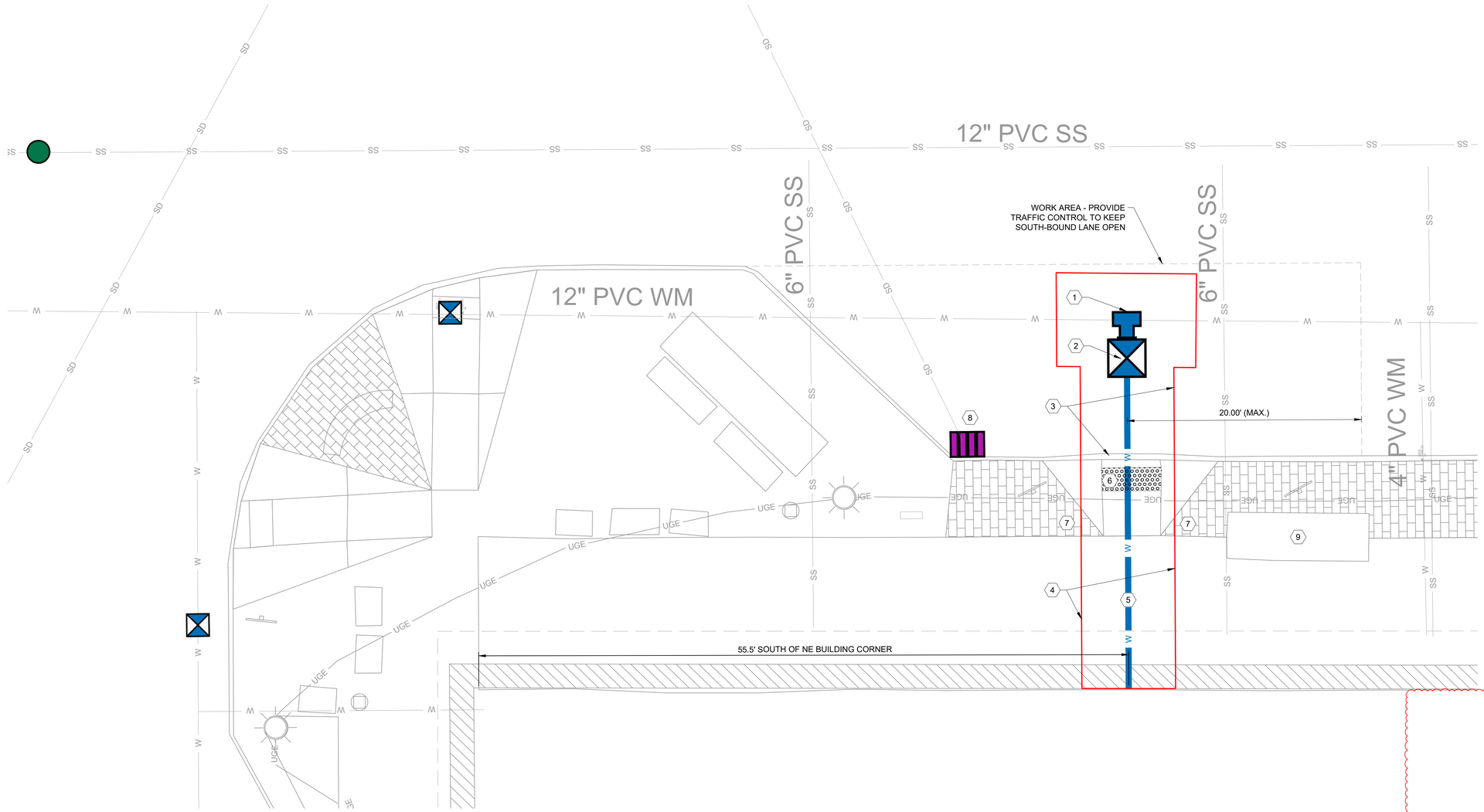
CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT P08122-2021-001
SHEET C202
ADA PARKING AREA DETAILS



NORTH

0 4
Scale in Feet

CONSTRUCTION NOTES

1. CONNECT TO WATERMAIN PER CITY OF MINOT STANDARD SPECIFICATIONS. CONTRACTOR TO VERIFY EXISTING MAIN MATERIAL AND SIZE.
2. 6" GATE VALVE.
3. RESTORE CONCRETE PAVING AND CURB & GUTTER AS PER CITY OF MINOT STANDARD SPECIFICATIONS AND DETAILS. TIE IN ALL SIDES WITH 16" No.4 DEFORMED BAR 18" O/C, DRILLED AND EPOXY IN PLACE. MATCH EXISTING STREET THICKNESS AND REINFORCE WITH No.4 DEFORMED BAR 2'x2' GRID PLACED MID-SLAB. MATCH EXISTING JOINTING. (1)
4. RESTORE CONCRETE SIDEWALK. MATCH EXISTING THICKNESS AND REINFORCE WITH No.4 DEFORMED BAR 2'x2' GRID PLACED MID-SLAB. MATCH EXISTING JOINTING. TIE IN ALL SIDES WITH 16" No.4 DEFORMED BAR 18" O/C, DRILLED INTO PLACE.
5. 6" PVC C900 FIRE SERVICE.
6. REPLACE ADA RAMP AND DETECTABLE WARNING PANEL PER CITY OF MINOT STANDARD SPECIFICATIONS AND ADA REQUIREMENTS.
7. RESTORE STAMPED CONCRETE. MATCH EXISTING THICKNESS AND REINFORCE WITH No.4 DEFORMED BAR 2'x2' GRID PLACED MID-SLAB. MATCH EXISTING STAMPED PATTERN. TIE IN ALL SIDES WITH 16" No.4 DEFORMED BAR 18" O/C, DRILLED INTO PLACE.6" (1)
8. PROVIDE EROSION CONTROL INLET PROTECTION PER CITY OF MINOT STANDARD DETAIL.
9. PROTECT EXISTING BENCH FROM DAMAGE, RETAIN ON SITE AND REINSTALL.

REVISION SCHEDULE		
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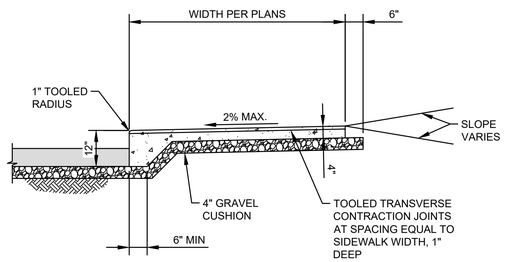
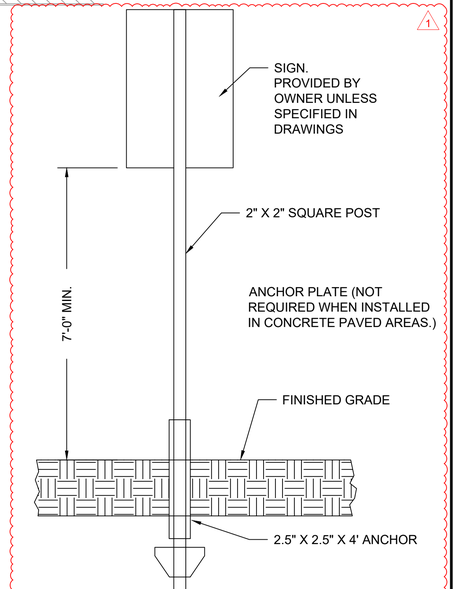
1	ADDENDUM #3	11/24/21



1 C203 **CONCRETE SIDEWALK, THICKENED EDGE**
SCALE: NONE



2 C203 **TYPICAL SIGN ISTALATION**
SCALE: NONE

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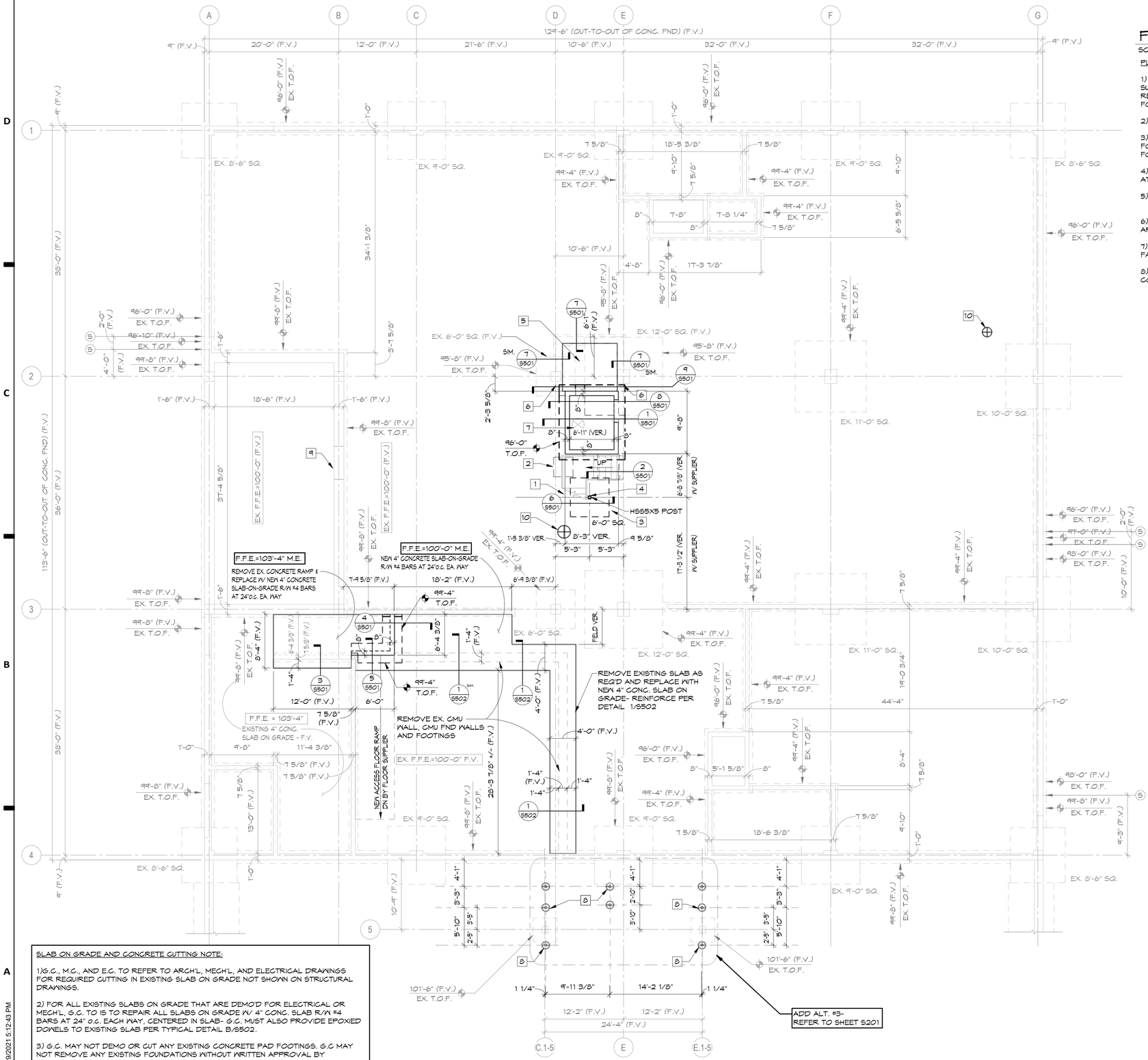
CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT P08122-2021-001
SHEET C203
WATERMAIN FIRE SERVICE



FOUNDATION PLAN

SCALE: 1/8" = 1'-0"

NORTH

PLAN NOTES:

1) ALL EXISTING PAD FOOTINGS ARE ASSMED TO BE CENTERED BELOW THE COLUMN THEY SUPPORT - SEE FOUNDATION PLAN. G.C. TO VERIFY NO EXISTING CONCRETE FOOTINGS ARE REMOVED OR DAMAGED DURING RENOVATIONS. G.C. MAY NOT CUT ANY EXISTING FOUNDATIONS OR FOOTINGS WITHOUTH APPROVAL OF STRUCTURAL EOR.

2) F.F.E. INDICATES FINISHED FLOOR/TOP OF SLAB ELEVATION.

3) ALL NEW PAD FOOTINGS ARE BE CENTERED BELOW THE COLUMN THEY SUPPORT - SEE FOUNDATION PLAN & PAD FOOTING SCHEDULE FOR SIZE & REINFORCING. SEE TYPICAL FOUNDATION DETAILS FOR COLUMN BASE PLATE INFORMATION

4) (S) ——► INDICATES STEP IN EXISTING WALL FOOTING. G.C. TO FIELD VERIFY AS NEEDED AT REQUIRED LOCATIONS.

5) XXX'-X" T.O.F. ► INDICATES TOP OF FOOTING ELEVATION.

6) "EX." & "EXIST'G" INDICATES EXISTING CONSTRUCTION. EXIST'G MEMBER SIZES & DIMENSIONS ARE ASSUMED- FIELD VERIFY AS REQ'D.

7) "F.V." INDICATES THAT DIMENSION IS TO BE FIELD VERIFIED PRIOR TO MATERIAL FABRICATION, CONCRETE CONSTRUCTION, OR STEEL FABRICATION ETC...

8) "M.E." INDICATES THAT DIMENSION IS TO BE FIELD VERIFIED AND MATCH EXISTING CORRESPONDING COMPONENT ELEVATION.

FOUNDATION CONSTRUCTION NOTES

1 REMOVE EX. CONC. SLAB AS REQ'D FOR NEW STAIR POST PAD FOOTING INSTALLATION- G.C. TO COORDINATE EXACT LOCATION WITH STAIR SUPPLIER PRIOR TO INSTALLATION- REPLACE CONC. SLAB WITH NEW 4" CONC. SLAB ON GRADE- REINFORCE WITH #4 HORIZ. EA. WAY AT 24"o.c. AND EPOXY DOWEL TO EX. SLAB PER DETAIL B/S502.

2 G.C. TO PROVIDE 3'-0" SQ.x8" THICKENED SLAB PAD CENTERED BELOW LOWER STAIR SUPPORT POST BELOW AS REQ'D BY STAIR SUPPLIER- SLAB TO BE REIN'D W/ (4)-#4 EA. WAY W/3" CLR TO BOT. OF SLAB AND DOWELED TO ADJACENT SLABS PER B/S502- G.C. IS TO VERIFY & COORDINATE REQ'D LOCATION & QUANITITIES OF POST WITH STAIR SUPPLIER PRIOR TO POURING SLAB- IF POSTS ARE NOT REQUIRED BY STAIR SUPPLIER/ENGINEER THERE IS NOT A NEED TO PROVIDE THICKENED SLAB- G.C. TO COORDINATE W/ STAIR SUPPLIER ANY AND ALL STAIR POSTS OR REQUIRED FND'S.

3 G.C. TO PROVIDE PAD FOUNDATION FOR HSS5x5 STAIR POST AS SHOWN ON PLAN AND FOOTING SCHEDULE. G.C. TO COORDINATE LOCATION WITH STAIR SUPPLIER. STAIR SUPPLIER ENGINEER IS REQUIRED TO DESIGN SIZE, TYPE, AND EMBEDMENTS OF ANCHORS TO FOUNDATION DESIGNED- SEE GENERAL STRUCTURAL NOTES & SPECIFICATIONS.

4 HSS5x5x5/16 REQ'D THICKNESS STAIR POST FOR UPPER STAIR SUPPORT. STAIR SUPPLIER IS REQUIRED TO DESIGN ALL STAIR COMPONENTS AND CONNECTIONS. HOWEVER, STAIR POST IS TO BE SQUARE HSS5x5 WITH THICKNESS OF POST, BASEPLATE SIZE, AND ANCHORS TO FOUNDATION DESIGNED BY STAIR ENGINEER- SEE GENERAL STRUCTURAL NOTES & SPECIFICATIONS. REFER TO ARCH'L DRAWINGS FOR STAIR & RAILING REQUIREMENTS. ALL STEEL STAIRS TO BE DESIGNED AND SHOPS DRAWINGS STAMPED BY PROFESSIONAL ENGINEER IN THE STATE OF NORTH DAKOTA.

5 G.C. TO PROVIDE SOIL INFILL ATOP AND WITHIN EXISTING ESCALATOR PIT PER GEOTECHNICAL REPORT TO ALLOW NEW 4" SLAB ON GRADE R/W #4 @ 24" o.c. E.W. CENTERED IN SLAB- DWL TO EXISTING SLABS PER DETAIL 7/S501 .

6 G.C. TO DEMO EXISTING ESCALATOR PIT WALLS, SLAB, AND FOOTINGS AS NEEDED TO PROVIDE NEW ELEVATOR PIT AS SHOWN- REFER TO ARCH'L.

7 G.C./MECH'L TO COORDINATE W/ ELEVATOR SUPPLIER SUMP PIT LOCATION. G.C./MECHNAICAL MUST LOCATE SUMP IN ELEVATOR PIT AT LOCATION IN WHICH IT DOES NOT REQUIRE EXISTING PAD FOOTING REMOVAL. SUMP PIT MUST BE LOCATED IN NEW 28" THICK PIT SLAB.

8 G.C. MUST COORDINATE W/ HELICAL SUPPLIER, ENGINEER, AND INSTALLER TO BATTER HELICAL PIERS AS NEEDED TO AVOID EXISTING PAD FOOTINGS AT LOCATIONS SHOWN. DO NOT DAMAGE OR ANCHOR HELICAL PIERS THRU EXISTING PAD FOOTINGS.

9 G.C. IS TO INCREASE EXITING DOOR HEAD HEIGHT AS NOTED ON SHEET S201- REFER TO SHEET S201 FOR OPENING REQUIREMENTS

10 G.C./MECH'L TO COORDINATE ALL REQUIRED SUMP PIT LOCATIONS. G.C./MECHNAICAL MUST LOCATE SUMP IN LOCATION IN WHICH IT DOES NOT DAMAGE EXISTING PAD FOOTING OR LOCATED WITHIN 2'-0" OF NEW PAD FOOTINGS. NO SUMP PIT EDGE MAY BE LOCATED WITHIN 2'-0" OF ANY NEW OR EXISTING PAD FOOTING.

SOIL BEARING CAPACITY NOTE:

New footings and foundations are designed for a maximum allowable soil bearing pressure of 1,500 psf, an assumed value. Design assumption shall be verified in writing by a licensed geotechnical engineer following on-site oberservation prior to placing concrete for footings. CWSTRUCTURAL not responsible for inspection of soil or any soil recommendations.

PAD FOOTING SCHEDULE

(ASSUMED 1,500 PSF ALLOWABLE SOIL BRG...

FOOTING REINFORCING NOTES:
1.) SPACE BARS EVENLY EACH WAY ACROSS MATS
2.) UNLESS NOTED OTHERWISE, ALL REBAR MATS ARE REQUIRED TO BE LOCATED 3" CLEAR FROM BOTTOM AND SIDES OF FOOTING

SIZE	THICKNESS	REINFORCEMENT
6'-0" SQ.	15"	(6)-#6 HORIZ. EA. WAY

SLAB ON GRADE AND CONCRETE CUTTING NOTE:

1) G.C., M.C., AND E.C. TO REFER TO ARCH'L, MECH'L, AND ELECTRICAL DRAWINGS FOR REQUIRED CUTTING IN EXISTING SLAB ON GRADE NOT SHOWN ON STRUCTURAL DRAWINGS.

2) FOR ALL EXISTING SLABS ON GRADE THAT ARE DEMO'D FOR ELECTRICAL OR MECH'L, G.C. TO IS TO REPAIR ALL SLABS ON GRADE W/ 4" CONC. SLAB R/W #4 BARS AT 24" O.C. EACH WAY, CENTERED IN SLAB- G.C. MUST ALSO PROVIDE EPOXIED DOWELS TO EXISTING SLAB PER TYPICAL DETAIL B/S502.

3) G.C. MAY NOT DEMO OR CUT ANY EXISTING CONCRETE PAD FOOTINGS. G.C MAY NOT REMOVE ANY EXISTING FOUNDATIONS WITHOUT WRITTEN APPROVAL BY STRUCTURAL EOR.

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REGISTERED PROFESSIONAL ENGINEER
KODY SCHAROSCH
PE 10770
DATE 11-4-21
NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
CW PROJECT# C2139A
SHEET S101
FOUNDATION PLAN

CWSTRUCTURAL ENGINEERS
1000 E. CALGARY AVE, SUITE 2
BISMARCK, ND 58503
701.221.3286 - WWW.CWSTRUCTURAL.NET

10/29/2021 5:12:43 PM

SECOND FLOOR FRAMING PLAN

SCALE: 1/8" = 1'-0"

NORTH

PLAN NOTES:

1) EX. F.F.E. (TOP OF FINISHED SLAB) ELEVATION IS EQUAL TO 114'-0" (U.N.O.) - EXISTING STRUCTURAL SLAB IS 3 1/2" THICK SLAB W/ 1 1/2" CONC. TOPPING SLAB (F.V.)

2) NUMBER IN BRACKETS ADJACENT TO STEEL BEAM SIZE WHICH IS CALLED OUT AS [1XX'-X"] INDICATES ACTUAL TOP OF BEAM ELEVATION. NUMBER IN PARENTHESIS ADJACENT TO BEAM SIZE WHICH IS CALLED OUT AS (XX'-X") IS TOP OF BEAM ELEVATION FROM REFERENCE ELEVATION. NO NUMBER ADJACENT TO BEAM SIZE INDICATES BEAM LOCATED DIREGLTY BELOW CONCRETE SLAB.

3) ⊙ INDICATES HELICAL PIER BY HELICAL SUPPLIER (8 TOTAL PIERS) FOR ADD ALT. #3 ONLY. REFER TO HELICAL PIER LOCATION AND DESIGN AND BID NOTES ON THIS SHEET FOR HELICAL REQUIREMENTS

4) SUPPORT FRAMING FOR STAIRS & LANDINGS WITHIN STAIR SHAFT, SHALL BE SUPPORTED FROM EX. CONC. BEAMS VIA LEDGERS AND LANDING HEADERS. COORDINATE WITH GENERAL CONTRACTOR TO EXACT DIMENSIONS AND FOR EMBEDS REQUIRED IN CONC. BEAMS FOR SUPPORT OF STAIR- STAIR SUPPLIER RESPONSIBLE FOR CONNECTION AND BEARING CONDITIONS. SEE GENERAL STRUCTURAL NOTES FOR STAIR DESIGN REQUIREMENTS.

CONSTRUCTION NOTES

1. 1000S200-68 (Fy=50ksi) STEEL STUD JOISTS AT 30"o.c. (MAX.)- G.C. MAY PROVIDE CONDUIT RUNS THRU CENTER OF 10" JOIST DEPTH, HOWEVER ALL HOLES MUST MEET CRITERIA STATED IN DETAIL 1/S601- REFER TO DETAIL 1/S601.
2. 2" CONCRETE SLAB ON 1/2" (NOMINAL) STEEL FORMDECK (VULCRAFT 0.6CX22 GAGE FORMDECK OR EQUAL) WITH 2-SPAN (MINIMUM) CONDITION- R/N #4 BARS AT 24"O.C. EACH WAY CENTERED IN SLAB.
3. PROVIDE ONE LINE 1000T150-54 TRACK BLOCKING BETWEEN EA. JOIST- SEE TYP. TRACK BLOCKING DETAIL
4. ALIGN STUD JOISTS WITH FLAT BACK TO EXISTING COLUMN- GENERAL CONTRACTOR TO ADJUST SPACING AS REQ'D TO ACCOMODATE EX. CONC. COLUMNS
5. G.C. TO PROVIDE CMU BOND BEAM FOR HEADER AND SILL FOR ELEVATOR DOOR- REFER TO ARCH'L FOR LOCATIONS AND SIZE OF OPENING. REFER TO STRUCTURAL DETAIL 2/S702 FOR CMU BOND BEAM SIZE AND REINFORCING.
6. PROVIDE BOND BREAKER BETWEEN NEW GRADE BEAMS AND EXISTING CONC. BEAM- DO NOT DOWEL NEW GRADE BEAM TO EXISTING CONCRETE BEAM- G.C. TO PROVIDE HOOKS AT END OF NEW GRADE BEAMS AS INDICATED ON DETAIL 3/S502.
7. G.C. MUST FIELD VERIFY BOTTOM OF EXISTING 18" THICK CONCRETE DOOR HEADER ELEVATION IS AT 106'-11 1/2". G.C. TO NOTIFY STRUCTURAL EOR IF EX. HEADER HEIGHT VARIES FROM 106'-11 1/2". IF EXISTING ASSUMPTION IS CORRECT, G.C. MAY SAWCUT THE BOTTOM 1'-6 1/2" OF EXISTING CONCRETE WALL HEADER, TO ALLOW NEW BOTTOM OF CONCRETE HEADER TO BE AT ELEVATION 108'-6" PER ARCHITECTURAL AND NO ADD'L NEW HEADER IS REQUIRED. DO NOT OVERCUT SAWCUT CORNERS AND OPENINING MAY NOT BE WIDENED- REFER TO ARCH'L FOR OPENING INFORMATION.
8. G.C. TO PROVIDE BLOCKOUT IN RAISED FLOOR FOR AV CONTROL CABINET- G.C. TO COORDINATE W/ ELECTRICAL FOR REQUIRED CABINET SIZE. G.C. ALSO TO PROVIDE 2X BLOCKING AS NEEDED BELOW CABINET TO SET AT CORRECT HEIGHT ATOP EXISTING CONCRETE SLAB- G.C. TO FRAME OPENING IN FLOOR W/ TRACKS AND STUD JOISTS PER TYPICAL DETAILS.
9. MECH'L PENETRATION THRU EXISTING CONC. SLAB- VERIFY SIZE LOCATION. DO NOT CUT OR DAMAGE EXISTING CONCRETE JOISTS BELOW- REFER TO DETAIL 6/S702 FOR REQUIRED REINFORCING AROUND MECH'L OPENINGS AT THIS LOCATION.

STAIR SUPPLIER/DESIGNER NOTE:

ON THE REQUIRED STAMPED SHOP DRAWINGS, STAIR SUPPLIER & LICENSED STAIR ENGINEER **MUST** PROVIDE ALL LOADS APPLIED TO EXISTING STRUCTURE IN ASD & LRFD INDIVIDUAL AND TOTAL LOAD CASES TO STRUCTURAL EOR, TO ENSURE CONNECTION IS NOT OVERLOADING EXISTING CONCRETE BEAMS. **THIS IS REQUIRED FOR ALL VERTICAL, HORIZONTAL, AND MOMENTS AT ANY CONNECTIONS OF THE STRINGERS OR POSTS.** SUPPORT FRAMING FOR STAIRS & LANDINGS WITHIN STAIR SHAFT, SHALL BE SUPPORTED FROM EX. CONC. BEAMS AND LANDING SUPPORT BEAM/POSTS. COORDINATE WITH GENERAL CONTRACTOR FOR EXACT DIMENSIONS AND FOR REQUIRED CONN. TO EX. CONC. BEAMS FOR SUPPORT OF STAIR- STAIR SUPPLIER RESPONSIBLE FOR ALL CONNECTIONS AND BEARING CONDITIONS TO EXISTING & NEW STRUCTURE. SEE GENERAL STRUCTURAL NOTES FOR STAIR DESIGN REQUIREMENTS.

MECH'L & ELECTR'L OPENINGS

FOR ALL REQUIRED NEW MECHANICAL & ELECTRICAL OPENINGS THROUGH TYPICAL EXISTING ELEVATED CONCRETE FLOOR SLABS REFER TO SHEET S301 M&E OPENING BOX NOTE. ALL NEW OPENINGS MUST MEET THIS SAME CRITERIA

HELICAL PIER DESIGN AND BID (ALTERNATE #3 ONLY) NOTES:

(1) HELICAL PIERS MUST ACHIEVE AN ALLOWABLE OR SERVICE LOAD CAPACITY OF 20 KIPS IN COMPRESSION AND 10 KIPS IN TENSION BASED ON A MINIMUM FACTOR OF SAFETY OF 2.0 RELATIVE TO ULTIMATE LOAD CAPACITY. HELICAL PIERS SHALL EXTEND TO A MINIMUM DEPTH OF 20' BELOW PROPOSED BOTTOM OF PIER CAP FOR BIDDING PURPOSES. A UNIT PRICE SHALL BE INCLUDED IN THE BID FOR LINEAR FOOTAGE OF HELICAL PIER TO BE ADDED OR SUBTRACTED FROM THE LUMP SUM BID PRICE FOR HELICAL PIERS BASED ON THE CAPACITIES INDICATED AT A TIP ELEVATION OF 20'. ALL ACTUAL LENGTHS OF HELICAL PIERS SHALL BE LOGGED IN THE FIELD DURING INSTALLATION AND A COMPLETE REPORT OF ACTUAL PIER LENGTHS SUBMITTED TO THE ENGINEER INCLUDING ACTUAL LENGTH OF PIER PLUS OR MINUS FROM THE TARGET BID TIP ELEVATION OF 20'.

(2) IN ADDITION TO ALL COMPRESSION AND TENSION LOADS STATED IN HELICAL NOTE #1 ABOVE, HELICAL PIERS BELOW GRADE BEAMS (8 TOTAL) ARE REQUIRED TO ALSO RESIST 800# IN SHEAR IN ANY DIRECTION. SUPPLIER IS RESPONSIBLE FOR DESIGN TO RESIST HELICAL SHEAR LOADS APPLIED IN ANY 4 DIRECTIONS. SUPPLIER IS ALLOWED TO BATTER PIERS OR GROUT AS REQUIRED TO RESIST LOADS INDICATED. ALL COST ASSOCIATED TO ACCOMMODATE SHEAR LOADS ARE TO BE INCLUDED ON THE BID AND NO ADDITIONAL CHARGES WILL BE INCURRED BY THE OWNER AFTER BID TO ACCOMMODATE INDICATED SHEAR LOADS. ANY ADDITIONAL COSTS OCCURRED DUE TO GROUTING OR BATTERING PIERS TO ACCOMMODATE SHEAR LOADS WILL BE BOURNE BY THE CONTRACTOR AFTER BID IS ACCEPTED. ALL PIER DESIGNS ARE BY THE HELICAL SUPPLIER.

(3) OWNER IS IN PROCESS OF PERFORMING SOIL BORINGS AND GEOTECHNICAL REPORT WILL BE AVAILABLE (AT NO COST TO THE HELICAL SUPPLIER/DESIGNER) FOR USE DURING DESIGN FOR THE HELICAL SUPPLIER/DESIGNER. ANY ADDITIONAL COSTS ASSOCIATED WITH SOILS INVESTIGATIONS RELATIVE TO HELICAL PIER CAPACITIES SHALL BE BOURNE BY THE HELICAL PIER SUPPLIER/INSTALLER AND INCLUDED ON ALTERNATE #3 TOTAL BID. FOR THE HELICAL SUPPLIER NO ADDITIONAL COSTS WILL BE PAID BY THE OWNER BEYOND ALTERNATE #3 BID FOR SOIL INVESTIGATION WORK. HELICAL PIER SHOP DRAWINGS SHALL BE PROVIDED INDICATING PIER DEPTH AND CAPACITY AND SHALL BE STAMPED BY A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF NORTH DAKOTA.

HELICAL PIER (ALTERNATE #3 ONLY) LOCATION NOTE:
1) ALL HELICAL PIERS ARE TO BE LOCATED CENTERED IN GRADE BEAM AT ELEVATION SHOWN ON DETAILS. HELICAL DESIGNER AND INSTALLER MUST BATTER HELIGALS AS NOTED ON THESE DRAWINGS TO AVOID AND MAINTAIN REQUIRED CLEARANCES FROM EX. FND BELOW AS SHOWN ON SHEET S101. ALL REQUIRED BATTERED HELIGALS MUST MEET REQUIRED LOADING CRITERIA STATED IN 'HELICAL PIER DESIGN AND BID' NOTE #2.

3) ALL HELICAL PIER LOCATIONS (VERTIGAL & BATTERED) ARE TO BE COORDINATED WITH CIVIL IN ORDER TO AVOID ANY UNDERGROUND UTILITES

ALTERNATE #3 - SOUTH ENTRY IMPROVEMENTS:

IF ALTERNATE #3 (SOUTH ENTRY) ADD IS ACCEPTED, THEN HELICAL PIERS, STEEL STUDS, GRADE BEAMS, AND STOOPS ARE TO BE INSTALLED ON THE SOUTH SIDE OF THE EXISTING BUILDING TO ACCOMMODATE SOUTH ENTRY IMPROVMENTS. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION. FOR BASE BID, NO MODFICATIONS ARE TO BE MADE TO THE SOUTH ENTRY.

ALTERNATE #5 -NANAWALL AT COUNCIL CHAMBERS:

IF ALTERNATE #5 (NANAWALL) ADD IS ACCEPTED, THEN STEEL HSS POSTS AND W14x22 W/ HAT CHANNEL ARE TO BE INSTALLED FOR NANAWALL SUPPORT. POSTS AND BEAMS ARE NOT TO BE PROVIDED AND INSTALL UNDER BASE BID.

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REGISTERED PROFESSIONAL ENGINEER
KODY SCHAROSCH
PE 10770
DATE 11-4-21
NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
CW PROJECT# C2139A
SHEET S201
SECOND FLOOR FRAMING PLAN

CW STRUCTURAL ENGINEERS
1000 E. CALGARY AVE, SUITE 2
BISMARCK, ND 58503
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THIRD FLOOR FRAMING PLAN

SCALE: 1/8" = 1'-0"

NORTH

PLAN NOTES:

1) EX. F.F.E. (TOP OF FINISHED SLAB) ELEVATION IS EQUAL TO 132'-0" (U.N.O.) - EXISTING STRUCTURAL SLAB IS 3 1/2" THICK SLAB W/ 1 1/2" CONC. TOPPING SLAB (F.V.)

2) NUMBER IN BRACKETS ADJACENT TO STEEL BEAM SIZE WHICH IS CALLED OUT AS [1XX'-X"] INDICATES ACTUAL TOP OF BEAM ELEVATION. NUMBER IN PARENTHESIS ADJACENT TO BEAM SIZE WHICH IS CALLED OUT AS (XX'-X") IS TOP OF BEAM ELEVATION FROM REFERENCE ELEVATION. NO NUMBER ADJACENT TO BEAM SIZE INDICATES BEAM LOCATED DIRECLTY BELOW CONCRETE SLAB.

3) SUPPORT FRAMING FOR STAIRS & LANDINGS WITHIN STAIR SHAFT, SHALL BE SUPPORTED FROM EX. CONC. BEAMS VIA. LEDGERS AND LANDING HEADERS. COORDINATE WITH GENERAL CONTRACTOR TO EXACT DIMENSIONS AND FOR EMBEDS REQUIRED IN CONC. BEAMS FOR SUPPORT OF STAIR- STAIR SUPPLIER RESPONSIBLE FOR CONNECTION AND BEARING CONDITIONS. SEE GENERAL STRUCTURAL NOTES FOR STAIR DESIGN REQUIREMENTS.

4) ELECTRIAL TRANSFORMER HUNG BELOW FLOOR (IN ROOM 227) FROM EXISTING CONC. FLOOR JOIST - G.C. TO PROVIDE CHANNEL FRAMING TO SUPPORT TRANSFORMER- SEE TYPICAL DETAIL 5/S702 .

CONSTRUCTION NOTES

1. G.C. TO PROVIDE CMU BOND BEAM FOR HEADER AND SILL FOR ELEVATOR DOOR- REFER TO ARCH'L FOR LOCATIONS AND SIZE OF OPENING. REFER TO STRUCTURAL DETAIL 2/S702 FOR CMU BOND BEAM SIZE AND REINFORGING.
2. G.C. TO PROVIDE C8x11.5 CHANNEL BRACING FROM NEW W18x50 TO EX. CONC. JOISTS @ 8'-6" O.C MAX.- REFER TO ON SHEET S301 & REFERENCED DETAIL 8/S602. G.C. TO FIELD LOCATE AS NEEDED TO AVOID ALL EXISTING CONC. DISTRIBUTION RIBS & JOISTS.
3. G.C. TO CONNECT NEW W18x50 STEEL BEAM TO SIDE OF EXISTING CONCRETE BEAMS EA. END PER TYPICAL TYPE 1D BEAM CLIP CONNECTION. REFER TO DETAIL B/S702.
4. MECH'L PENETRATION THRU EXISTING CONC. SLAB- VERIFY SIZE LOCATION. DO NOT CUT OR DAMAGE EXISTING CONCRETE JOISTS BELOW- REFER TO DETAIL 8/S702 FOR REQUIRED REINFORGING AROUND MECH'L OPENINGS AT THIS LOCATION.

STAIR SUPPLIER/DESIGNER NOTE:

ON THE REQUIRED STAMPED SHOP DRAWINGS, STAIR SUPPLIER & LICENSED STAIR ENGINEER **MUST** PROVIDE ALL LOADS APPLIED TO EXISTING STRUCTURE IN ASD & LRFD INDIVIDUAL AND TOTAL LOAD CASES TO STRUCTURAL EOR, TO ENSURE CONNECTION IS NOT OVERLOADING EXISTING CONCRETE BEAMS. **THIS IS REQUIRED FOR ALL VERTICAL, HORIZONTAL, AND MOMENTS AT ANY CONNECTIONS OF THE STRINGERS OR POSTS.** SUPPORT FRAMING FOR STAIRS & LANDINGS WITHIN STAIR SHAFT, SHALL BE SUPPORTED FROM EX. CONC. BEAMS AND LANDING SUPPORT BEAM/POSTS. COORDINATE WITH GENERAL CONTRACTOR FOR EXACT DIMENSIONS AND FOR REQUIRED CONN. TO EX. CONC. BEAMS FOR SUPPORT OF STAIR- STAIR SUPPLIER RESPONSIBLE FOR ALL CONNECTIONS AND BEARING CONDITIONS TO EXISTING & NEW STRUCTURE. SEE GENERAL STRUCTURAL NOTES FOR STAIR DESIGN REQUIREMENTS.

MECHANICAL & ELECTRICAL OPENING THROUGH EXISTING ELEVATED CONCRETE FLOOR & ROOF SLAB NOTE:

PRIOR TO CORE DRILLING ANY OPENINGS IN THE EXISTING CONCRETE FLOOR SLAB THRU 2ND FLOOR, 3RD FLOOR, OR ROOF, G.C. AND CONTRACTOR MUST VERIFY CORE OPENINGS ARE BETWEEN EXISTING CONCRETE JOISTS AND BEAMS. G.C., M.C., AND E.C. MUST CORE **ONLY** THRU CONCRETE SLABS AND **NOT** INTO CONCRETE BEAMS OR JOISTS. ALL OPENINGS THRU FLOOR MUST FOLLOW THE FOLLOWING REQUIREMENTS:

1) A MAXIMUM OF 12" DIAMETER OPENING MAY BE CORE DRILLED THRU THE CONCRETE SLAB (NOT THE CONCRETE JOISTS OF BEAMS). ANY HOLE 12" DIA. OR SMALLER HOLE DOES **NOT** REQUIRE ANY REINFORGING AROUND THE CORE DRILLED HOLE. NO OTHER CORE DRILLED HOLES SIZED 12" OR SMALLER MAY BE LOCATED WITHIN 3'-0" OF ANY OTHER HOLES.

2) IF MULTIPLE HOLES ARE REQUIRED RIGHT NEXT TO EACHOTHER THRU THE SLAB (i.e. THREE TOTAL 4" DIA. HOLES), MULTIPLE HOLES MAY BE CORE DRILLED RIGHT NEXT TO EACHTOHER FOR M&E, HOWEVER THE TOTAL COMBINED SIZE OF CORE DRILLED OPENING MUST NOT EXCEED A 12" WIDE BY 12" LONG OPENING. THE OPENING MUST ALSO BE MADE USING ALL CORE DRILLED HOLES, IT MAY NOT BE SAW CUT. NO OTHER OPENINGS MAY BE MADE WITHIN 3'-0" OF ANY EDGE OF THE COMBINED OPENING WITH SIZE MENTIONED ABOVE. FOR THIS SITUATION NO ADD'L REINFORCING OF THE SLAB IS REQUIRED. MULTIPLE HOLES MAYBE DRILLED WITHOUT PROVIDING EXISTING SLAB REINFORGING USING THE PREVIOUSLY STATED PARAMETERS.

3) ANY SLAB OPENINGS WHICH EXCEED THE PARAMETERS STATED ABOVE MUST BE CALLED OUT ON STRUCTURAL PLANS OR NO OPENING MAY BE PROVIDED. G.C. TO CREATE AND REINFORCE OPENINGS AS DIRECTED ON STRUCTURAL PLANS.

4) FOR ANY OPENINGS WHICH ARE REQUIERED THAT FALL OUTSIDE PARAMETER STATED IN NOTES 1 OR 2 ABOVE, AND ARE NOT LOCATED AND MENTIONED ON THE STRUCTURAL DRAWINGS, G.C. MUST CONTACT STRUCTURAL ENGINEER FOR FURTHER CLARIFICATIONS. THE G.C., MECH'L, OR ELECTRICAL MUST RECEIVE WRITTING APPROVAL FOR ALL OPENINGS THRU EXISTING CONCRETE FLOOR SLABS WHICH ARE LARGER THAN THE 12" DIAMETER OR 12"x12" SIZE STATED (STATED IN NOTE 1 & 2 ABOVE), UNLESS THEY ARE LOCATED AND DISCUSSED ON THE STRUCTURAL DRAWINGS.

ALTERNATE #3 - SOUTH ENTRY IMPROVEMENTS:

IF ALTERNATE #3 (SOUTH ENTRY) ADD IS ACCEPTED, THEN HELICAL PIERS, STEEL STUDS, GRADE BEAMS, AND STOOPS ARE TO BE INSTALLED ON THE SOUTH SIDE OF THE EXISTING BUILDING TO ACCMMODATE SOUTH ENTRY IMPROVMENTS. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION. FOR BASE BID, NO MODFICATIONS ARE TO BE MADE TO THE SOUTH ENTRY.

ALTERNATE #5 -NANAWALL AT COUNCIL CHAMBERS:

IF ALTERNATE #5 (NANAWALL) ADD IS ACCEPTED, THEN STEEL HSS POSTS AND W14x22 W/ HAT CHANNEL ARE TO BE INSTALLED FOR NANAWALL SUPPORT. POSTS AND BEAMS ARE **NOT** TO BE PROVIDED AND INSTALL UNDER BASE BID.

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CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466

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11/04/21

PHASE
CONSTRUCTION DOCUMENTS

CW PROJECT#
C2139A

SHEET
S301
THIRD FLOOR FRAMING PLAN

CW STRUCTURAL ENGINEERS
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BISMARCK, ND 58503
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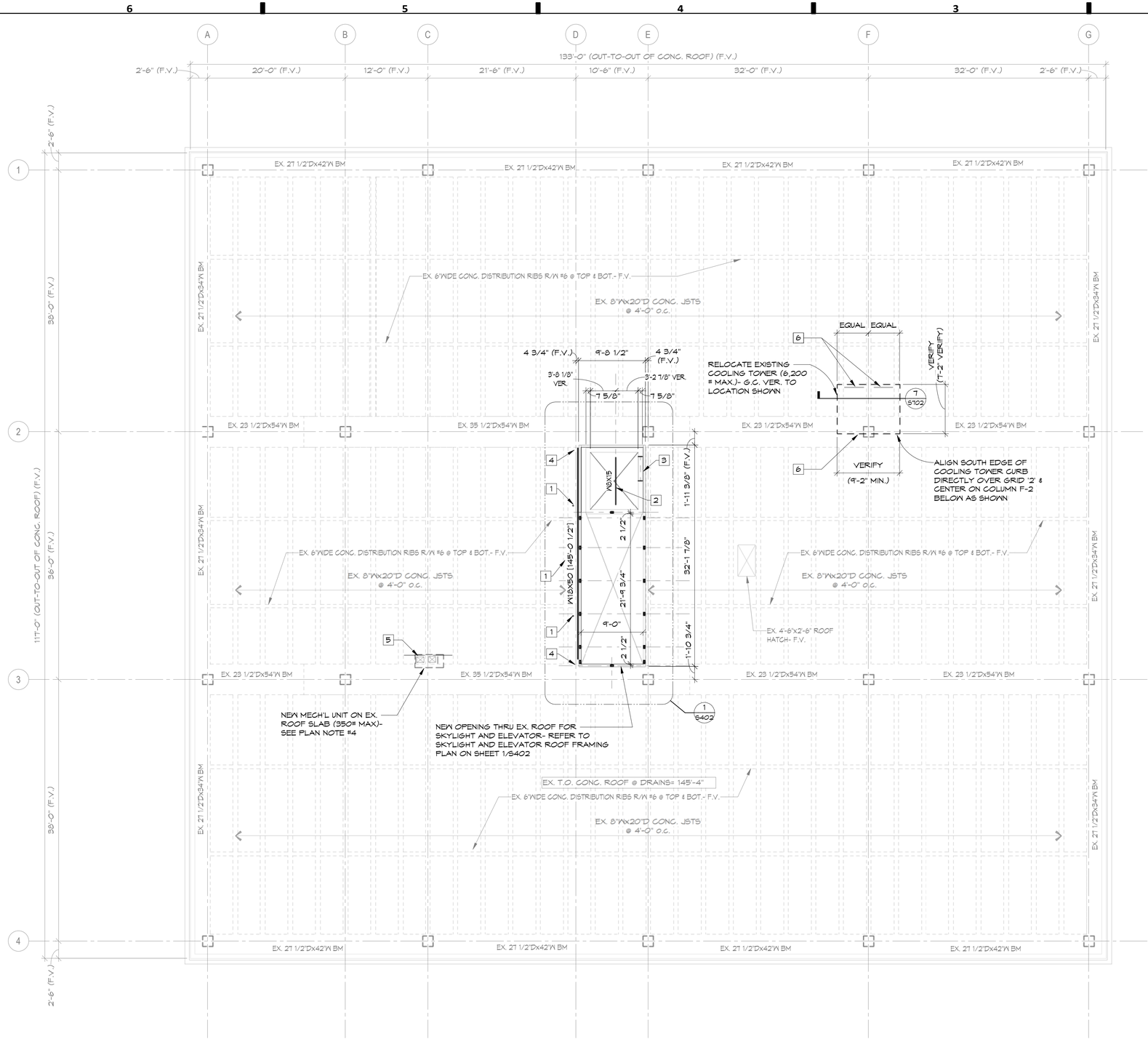

ROOF FRAMING PLAN

SCALE: 1/8" = 1'-0"

NORTH

PLAN NOTES:

1) BOTTOM OF EXISTING ROOF SLAB IS EQAUL TO 145'-0 1/2". ROOF SLAB THICKNESS IS SLOPING AND VARIES FROM 7 1/2" (MAX.) TO 3 1/2" (MIN.) THICK AT ROOF DRAINS. G.C. TO FIELD VERIFY THICKNESS AS NEEDED.

2) NUMBER IN BRACKETS ADJACENT TO STEEL BEAM SIZE WHICH IS CALLED OUT AS [1XX'-X"] INDICATES ACTUAL TOP OF BEAM ELEVATION. NUMBER IN PARENTHESIS ADJACENT TO BEAM SIZE WHICH IS CALLED OUT AS (XX'-X") IS TOP OF BEAM ELEVATION FROM REFERENCE ELEVATION. NO NUMBER ADJACENT TO BEAM SIZE INDICATES BEAM LOCATED DIRECLTY BELOW CONCRETE SLAB.

3) ALL PLUMBING AND MECH'L VENTS/DRAINS THRU ROOF ARE TO BE COORDINATED AND FIELD VERIFIED WITH MECH'L. DO NOT CUT ANY EXISTING CONC. JOISTS. REFER TO MECHANICAL AND ELECTRICAL OPENING THRU EXISTING ROOF BOX NOTE ON THIS SHEET FOR ADD'L INFORMATION. G.C. VERIFY SIZE, NUMBER & LOCATION WITH ARCH'L & MECH'L- VENTS THRU ROOF NOT SHOWN ON STRUCTURAL DRAWINGS. REFER TO

4) MECH'L UNIT ATOP ROOF- G.C. TO SUPPORT AND FRAME ALL 4 SIDES WITH L2.5x2.5x5/16"- FASTEN TO EX. CONC. SLAB WITH HILTI KWK GON II CONC. SCREW ANCHORS AT 12"O.C AND CONN. TO EX. CONC. JOISTS.- VERIFY SIZE, NUMBER & LOCATION WITH MECH'L.- SEE SIMILAR DETAIL 8/S702 .

ROOF CONSTRUCTION NOTES

1. G.C. TO PROVIDE C8x11.5 CHANNEL BRACING FROM NEW W18x50 TO EX. CONC. JOISTS @ 8'-6" O.C MAX.- REFER TO PLAN 1/S402 & REFERENCED DETAIL 4/S402. G.C. TO FIELD LOCATE AS NEEDED TO AVOID ALL EXISTING CONC. JOISTS.
2. W8x15 ELEVATOR HOIST BEAM WITH T.O.S. ASSUMED TO BE AT ELEVATION 145'-4". HOIST BM TO BE CONNECTED TO CMU WALL EA. END PER TYPICAL DETAIL 1/S702. PRIOR TO MASONRY FABRICATION, G.C. IS TO VERIFY SIZE, LOCATION, AND HEIGHT OF HOIST BEAM PER MANUFACTURERS REQUIREMENTS. G.C. TO PROVIDE LOADING CRITERIA TO EOR TO VERIFY W8x15 IS ADEQUATE FOR HOIST BEAM LOADING REQUIREMENTS.
3. G.C. TO PROVIDE CMU BOND BEAM FOR HEADER AND SILL FOR ELEVATOR DOOR- REFER TO ARCH'L FOR LOCATIONS AND SIZE OF OPENING. REFER TO STRUCTURAL DETAIL 2/S702 FOR CMU BOND BEAM SIZE AND REINFORCING.
4. G.C. TO CONNECT NEW W18x50 STEEL BEAM TO SIDE OF EXISTING CONCRETE BEAMS EA. END PER TYPICAL TYPE 1D BEAM CLIP CONNECTION. REFER TO DETAIL B/S702.
5. MECH'L PENETRATION THRU EXISTING CONC. ROOF SLAB- VERIFY SIZE LOCATION. DO NOT CUT OR DAMAGE EXISTING CONCRETE JOISTS BELOW- REFER TO DETAIL 6/S702 FOR REQUIRED REINFORCING AROUND MECH'L OPENINGS AT THIS LOCATION.
6. G.C. TO LOCATE RELOCATED COOLING TOWERS SOUTH SIDE CURB ATOP OF CONC. BEAM ON GRID 2 & THEN PROVIDE ADDITION STEEL FRAMING (C8x11.5) BELOW NORTH SIDE UNIT CURB PER STRUCTURAL DETAIL 7/S702. UNIT LOCATIONS MUST BE COORDINATED EXACTLY TO CENTER NORTH SIDE CURB DIRECTLY ATOP OF NEW C8x11.5 REINFORCING.

MECHANICAL & ELECTRICAL OPENING THROUGH EXISTING ELEVATED CONCRETE FLOOR & ROOF SLAB NOTE:

PRIOR TO CORE DRILLING ANY OPENINGS IN THE EXISTING CONCRETE FLOOR SLAB THRU 2ND FLOOR, 3RD FLOOR, OR ROOF, G.C. AND CONTRACTOR MUST VERIFY CORE OPENINGS ARE BETWEEN EXISTING CONCRETE JOISTS AND BEAMS. G.C., M.C., AND E.C. MUST CORE **ONLY** THRU CONCRETE SLABS AND **NOT** INTO CONCRETE BEAMS OR JOISTS. ALL OPENINGS THRU FLOOR MUST FOLLOW THE FOLLOWING REQUIREMENTS:

1) A MAXIMUM OF 12" DIAMETER OPENING MAY BE CORE DRILLED THRU THE CONCRETE SLAB (NOT THE CONCRETE JOISTS OF BEAMS). ANY HOLE 12" DIA. OR SMALLER HOLE DOES **NOT** REQUIRE ANY REINFORCING AROUND THE CORE DRILLED HOLE. NO OTHER CORE DRILLED HOLES SIZED 12" OR SMALLER MAY BE LOCATED WITHIN 3'-0" OF ANY OTHER HOLES.

2) IF MULTIPLE HOLES ARE REQUIRED RIGHT NEXT TO EACHOTHER THRU THE SLAB (i.e. THREE TOTAL 4" DIA. HOLES), MULTIPLE HOLES MAY BE CORE DRILLED RIGHT NEXT TO EACHTOHER FOR M&E, HOWEVER THE TOTAL COMBINED SIZE OF CORE DRILLED OPENING MUST NOT EXCEED A 12" WIDE BY 12" LONG OPENING. THE OPENING MUST ALSO BE MADE USING ALL CORE DRILLED HOLES, IT MAY NOT BE SAW CUT. NO OTHER OPENINGS MAY BE MADE WITHIN 3'-0" OF ANY EDGE OF THE COMBINED OPENING WITH SIZE MENTIONED ABOVE. FOR THIS SITUATION NO ADD'L REINFORCING OF THE SLAB IS REQUIRED. MULTIPLE HOLES MAYBE DRILLED WITHOUT PROVIDING EXISTING SLAB REINFORCING USING THE PREVIOUSLY STATED PARAMETERS.

3) ANY SLAB OPENINGS WHICH EXCEED THE PARAMETERS STATED ABOVE MUST BE CALLED OUT ON STRUCTURAL PLANS OR NO OPENING MAY BE PROVIDED. G.C. TO CREATE AND REINFORCE OPENINGS AS DIRECTED ON STRUCTURAL PLANS.

4) FOR ANY OPENINGS WHICH ARE REQUIERED THAT FALL OUTSIDE PARAMETER STATED IN NOTES 1 OR 2 ABOVE, AND ARE NOT LOCATED AND MENTIONED ON THE STRUCTURAL DRAWINGS, G.C. MUST CONTACT STRUCTURAL ENGINEER FOR FURTHER CLARIFICATIONS. THE G.C., MECH'L, OR ELECTRICAL MUST RECEIVE WRITTING APPROVAL FOR ALL OPENINGS THRU EXISTING CONCRETE FLOOR SLABS WHICH ARE LARGER THAN THE 12" DIAMETER OR 12"x12" SIZE STATED (STATED IN NOTE 1 & 2 ABOVE), UNLESS THEY ARE LOCATED AND DISCUSSED ON THE STRUCTURAL DRAWINGS.

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CITY PROJECT 4466
DATE
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CONSTRUCTION DOCUMENTS
CW PROJECT#
C2139A
SHEET
S401
ROOF FRAMING PLAN

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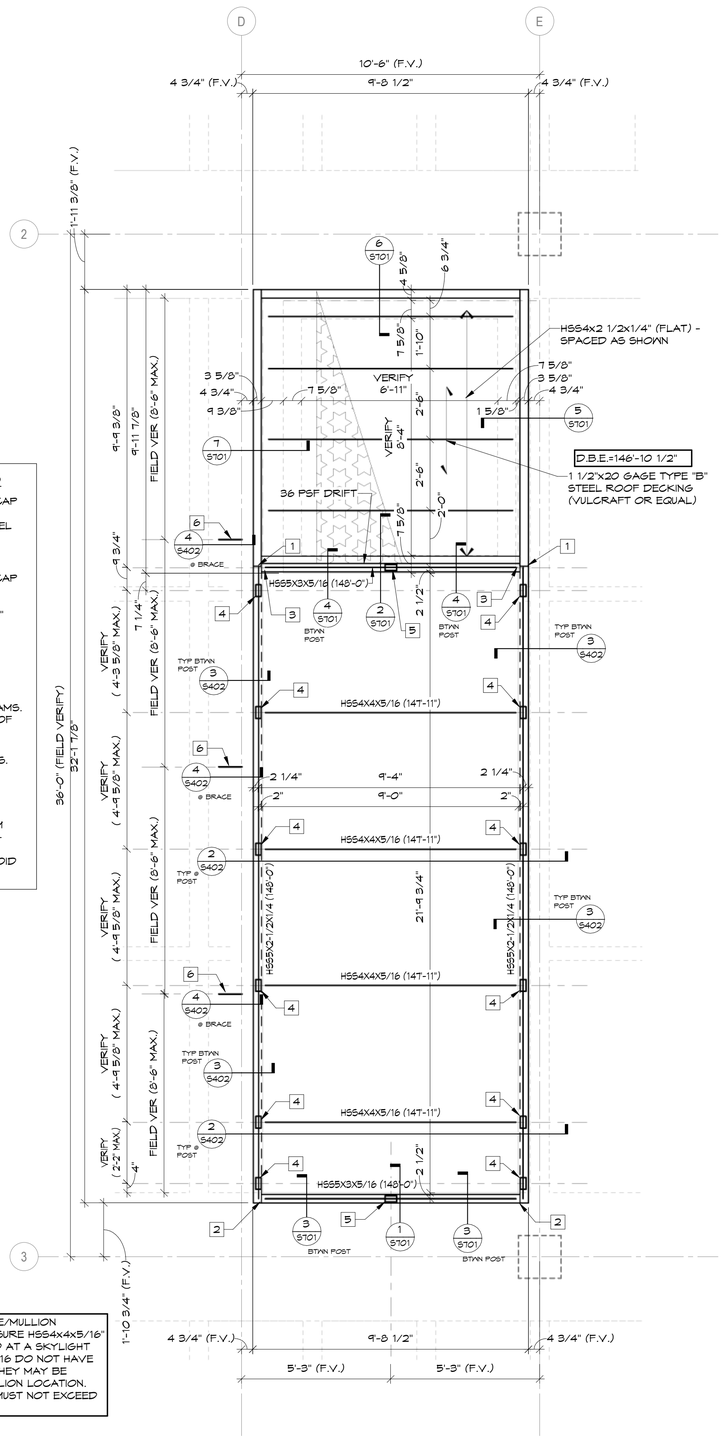
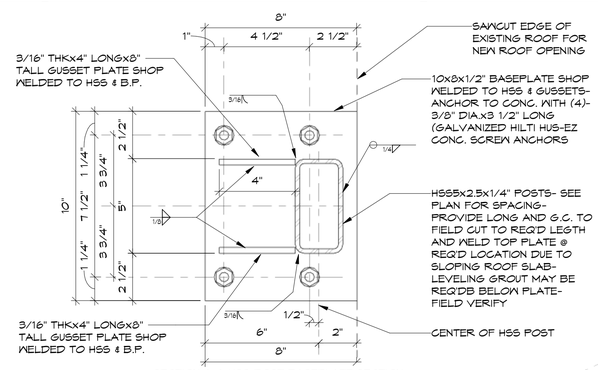
SKYLIGHT CONSTRUCTION NOTES

1. SHOP WELD 6" HIGHx3 1/2" WIDEx5/16" THICK END CAP (W/ 3/16" FILLET WELD ALL AROUND) TO END OF HSS5x2 1/2x1/4" BEAM. G.C. TO FASTEN 3 5/8" STEEL STUD THRU WEB TO SIDE OF END CAP W/ (3)-#12 SCREWS.
2. SHOP WELD 6" HIGHx3 1/2" WIDEx5/16" THICK END CAP (W/ 3/16" FILLET WELD ALL AROUND) TO END OF HSS5x2 1/2x1/4" BEAM. G.C. TO BUTT AND WELD HSS5x3x5/16 TO SIDE OF HSS5x2 1/2x1/4" WITH 1/4" FILLET OR BEVEL WELD ALL-AROUND.
3. G.C. TO BUTT AND WELD HSS5x3x5/16 TO SIDE OF HSS5x2 1/2x1/4" WITH 1/4" FILLET OR BEVEL WELD ALL-AROUND.
4. HSS5x2 1/2x1/4" POST BELOW HSS5x2 1/2x1/4" BEAMS. LOCATE CENTER OF POSTS 2" FROM EDGE OF ROOF OPENING AT THIS LOCATION- REFER TO DETAIL.
5. HSS5x2 1/2x1/4" POST BELOW HSS5x3x5/16" BEAMS. LOCATE CENTER OF POSTS 2 1/2" FROM EDGE OF ROOF OPENING AT THIS LOCATION- REFER TO REFERENCED DETAIL FOR BASE CONNECTION.
6. G.C. TO PROVIDE C8x11.5 CHANNEL BRACING FROM NEW W18x50 TO EX. CONC. JOISTS @ 8'-6" o.c MAX.- REFER TO PLAN 1/S402 & REFERENCED DETAIL 4/S402. G.C. TO FIELD LOCATE AS NEEDED TO AVOID ALL EXISTING CONC. JOISTS.

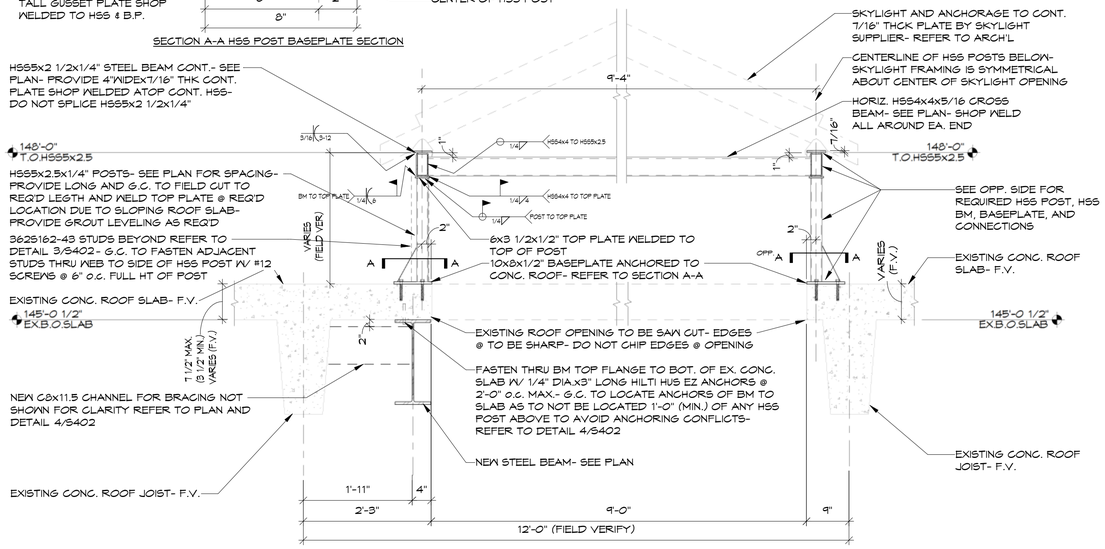


1 S402 SKYLIGHT/ELEVATOR PARAPET FRAMING PLAN
SCALE: 3/8" = 1'-0"

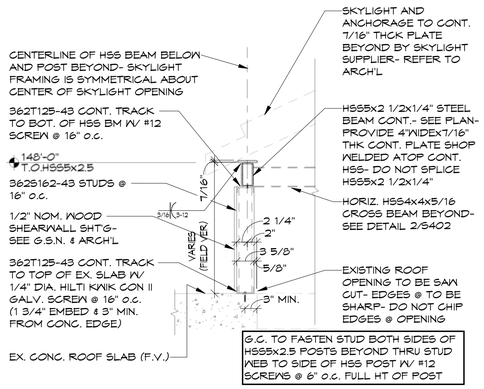
G.C. IS TO VERIFY AND COORDINATE SKYLIGHT FRAME/MULLION CONNECTION LOCATIONS WITH STEEL SUPPLIER TO ENSURE HSS4x4x5/16" CROSS BRACE BEAMS AND HSS POSTS ARE LOCATED AT A SKYLIGHT FRAME/MULLIONS CONNECTION LOCATION. HSS4x4x5/16 DO NOT HAVE TO BE LOCATED AT EVERY CONNECTION LOCATION. THEY MAY BE LOCATED AT EVERY OTHER CONNECTION FRAME/MULLION LOCATION. HOWEVER, HSS4x4x5/16" BRACE & POST LOCATIONS MUST NOT EXCEED MAXIMUM SPACINGS AS SHOWN ON PLAN



SECTION A-A HSS POST BASEPLATE SECTION

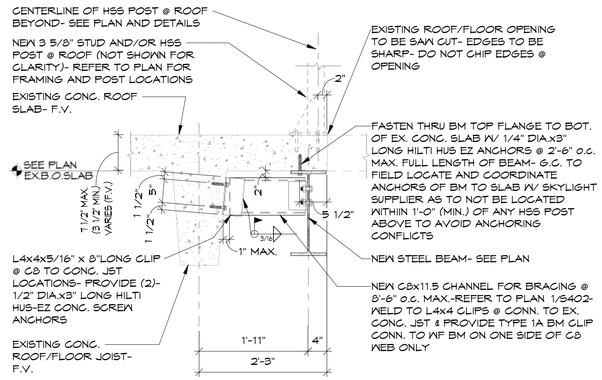


2 S402 SKYLIGHT CURB FRAMING @ POSTS
SCALE: 3/4" = 1'-0"



G.C. TO FASTEN STUD BOTH SIDES OF HSS5x2.5 POSTS BEYOND THRU STUD WEB TO SIDE OF HSS POST W/ #12 SCREWS @ 6" o.c. FULL HT OF POST

3 S402 SKYLIGHT CURB FRAMING BTWN POSTS
SCALE: 3/4" = 1'-0"



4 S402 NEW STEEL BEAM BRACING TO EX. JSTS
SCALE: 3/4" = 1'-0"

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PHASE CONSTRUCTION DOCUMENTS

CW PROJECT# C2139A

SHEET S402

SKYLIGHT & ELEVATOR FRAMING PLAN

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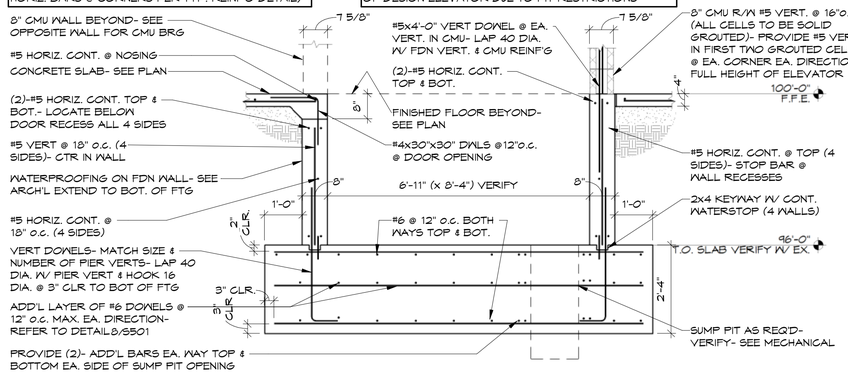
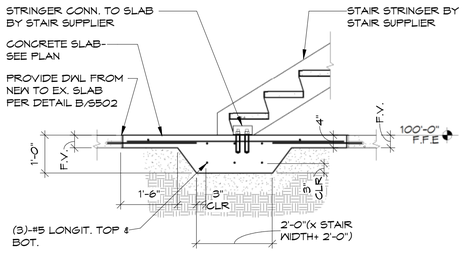
NOTE:
8" B.B. R/W (2) #5 HORIZ. @ FILLED WITH 3,000psi CONCRETE @ 4'-8"o.c. FULL HT. OF WALL (DOWEL ALL HORIZ. BARS @ CORNERS PER TYP. REINF'G DETAIL)

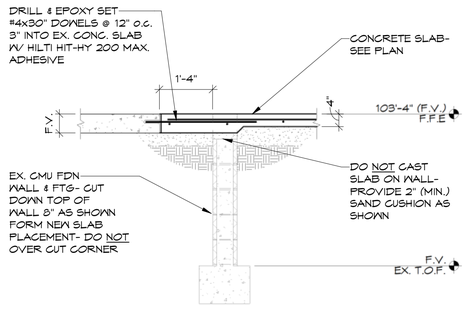
NOTE: G.C. VERIFY ALL ELEVATOR PIT DIMS AND DEPTH W/ ELEVATOR SUPPLIER- COORDINATE VARIANCES W/ ARCH'L & STRUCT'L G.C. MUST USE BASIS OF DESIGN ELEVATOR DUE TO PIT RESTRICTIONS



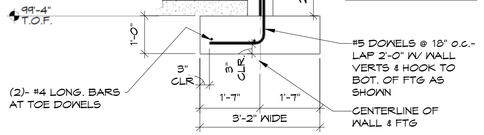
1 S501 ELEVATOR PIT SECTION
SCALE: 1/2" = 1'-0"



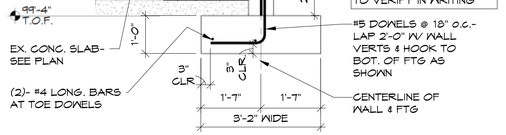
2 S501 STAIR STRINGER BEARING DETAIL
SCALE: 1/2" = 1'-0"



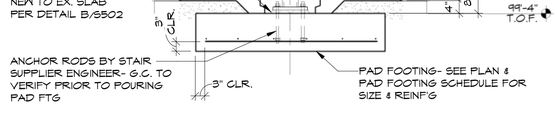
3 S501 NEW SLAB OVER EXIST'G FDN WALL
SCALE: 1/2" = 1'-0"



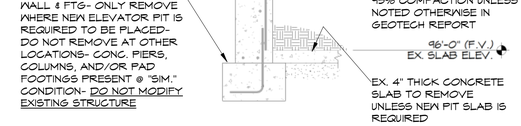
4 S501 INTERIOR FOUNDATION RETAINING WALL
SCALE: 1/2" = 1'-0"



5 S501 INTERIOR FOUNDATOIN WALL @ RAMP
SCALE: 1/2" = 1'-0"



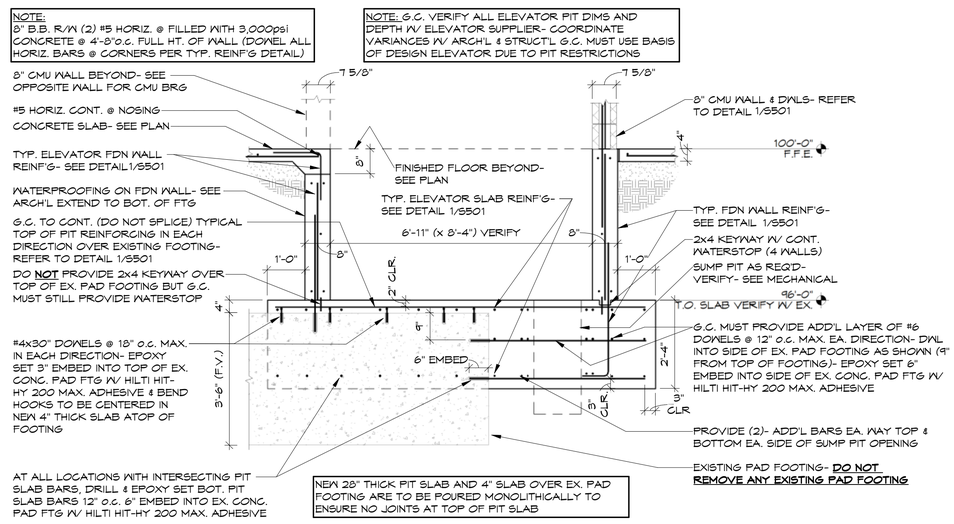
6 S501 INTERIOR HSS COLUMN BRG ON PAD FTG
SCALE: 1/2" = 1'-0"



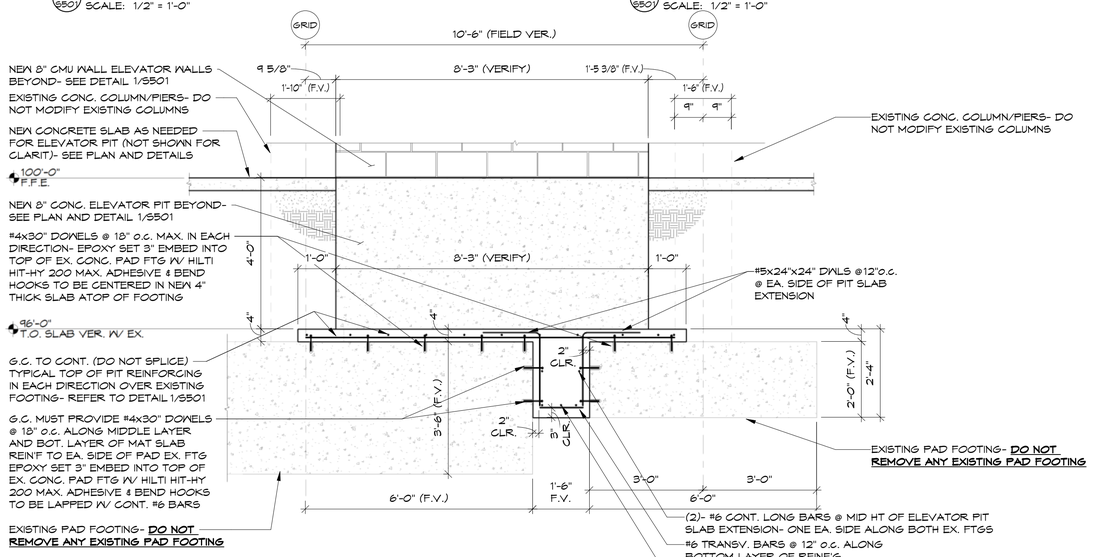
7 S501 INFILL @ EXISTING ESCALATOR
SCALE: 1/2" = 1'-0"

NOTE:
8" B.B. R/W (2) #5 HORIZ. @ FILLED WITH 3,000psi CONCRETE @ 4'-8"o.c. FULL HT. OF WALL (DOWEL ALL HORIZ. BARS @ CORNERS PER TYP. REINF'G DETAIL)

NOTE: G.C. VERIFY ALL ELEVATOR PIT DIMS AND DEPTH W/ ELEVATOR SUPPLIER- COORDINATE VARIANCES W/ ARCH'L & STRUCT'L G.C. MUST USE BASIS OF DESIGN ELEVATOR DUE TO PIT RESTRICTIONS



8 S501 ELEVATOR PIT SECTION @ EX. PAD FTG.
SCALE: 1/2" = 1'-0"



9 S501 ELEVATOR SLAB AT EX. PAD FTG.
SCALE: 1/2" = 1'-0"

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DATE 11-4-21
NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY HALL REHABILITATION

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MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
CW PROJECT# C2139A
SHEET S501
FOUNDATION DETAILS

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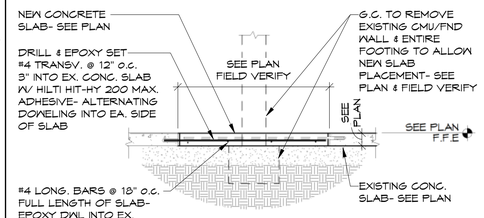
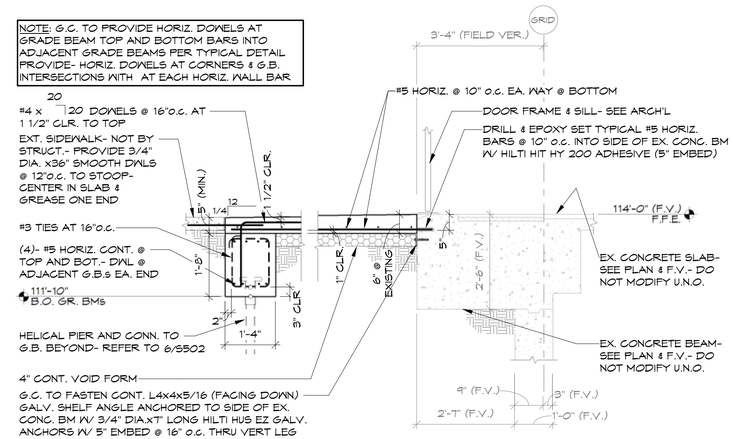
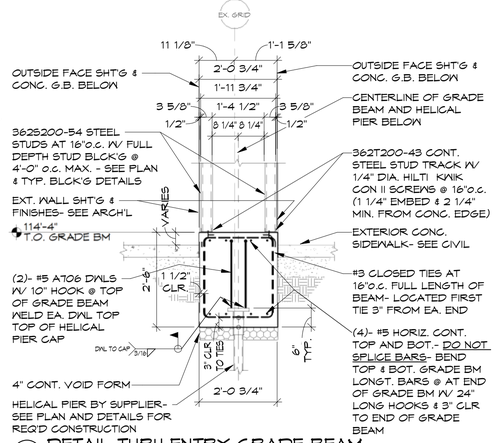


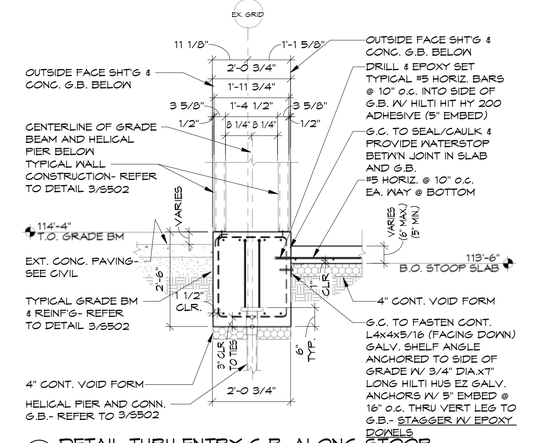
1 S502 NEW SLAB INFILL AT EX. FDN WALL REMOVAL
SCALE: 1/2" = 1'-0"



2 S502 TYP. ENTRY STOOP FOUNDATION REINF'G
SCALE: 1/2" = 1'-0"



3 S502 DETAIL THRU ENTRY GRADE BEAM
SCALE: 1/2" = 1'-0"



4 S502 DETAIL THRU ENTRY G.B. ALONG STOOP
SCALE: 1/2" = 1'-0"

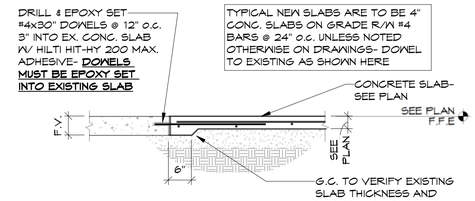
5 S502 ENTRY GRADE BEAM AT COLUMN
SCALE: 1/2" = 1'-0"

6 S502 TYP. ENTRY STOOP G.B. REINF'G
SCALE: 1/2" = 1'-0"

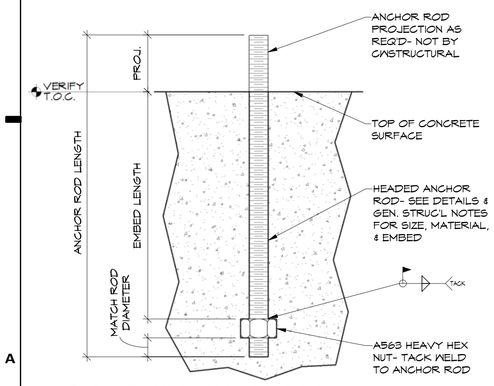
SLAB DOWEL SCHEDULE

SLAB THICKNESS	SMOOTH DOWEL		
	DIAMETER	LENGTH	SPACING
4"	1/2"	16"	18"

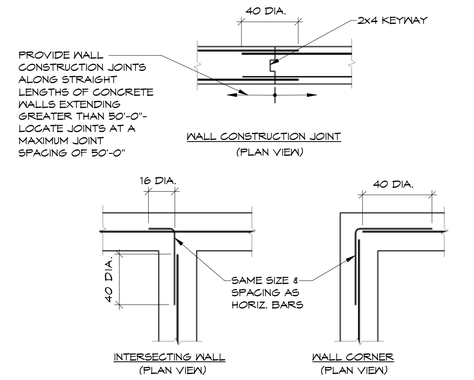
A S502 TYP. 4" SLAB-ON-GRADE JOINTING DETAIL
SCALE: 1/2" = 1'-0"



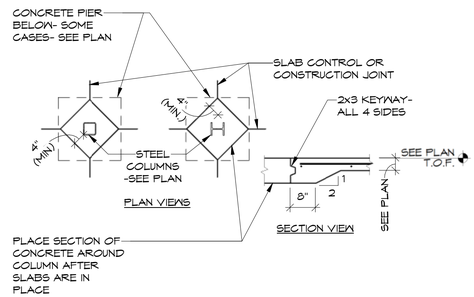
B S502 TYP. NEW SLAB DWL TO EXIST'G SLAB
SCALE: 1/2" = 1'-0"



C S502 TYP. HEADED ANCHOR ROD
SCALE: 1/2" = 1'-0"



D S502 TYP. CONC. WALL & GRADE BM REINFORCING
SCALE: 1/2" = 1'-0"



E S502 TYP. COLUMN ISOLATION JOINT
SCALE: 1/2" = 1'-0"

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SHEET S502
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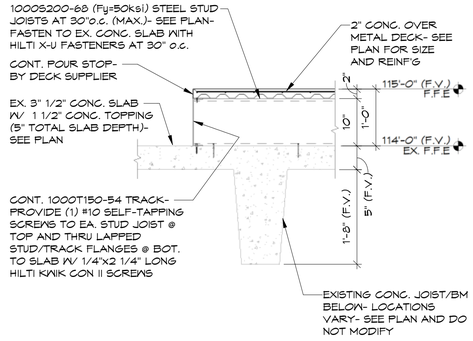
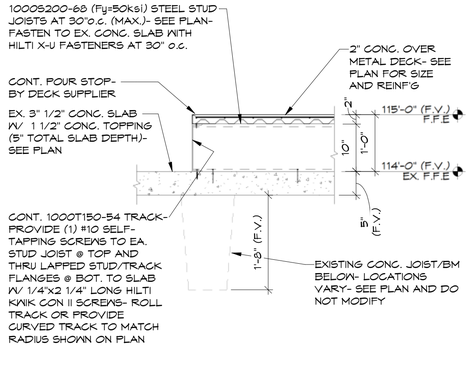
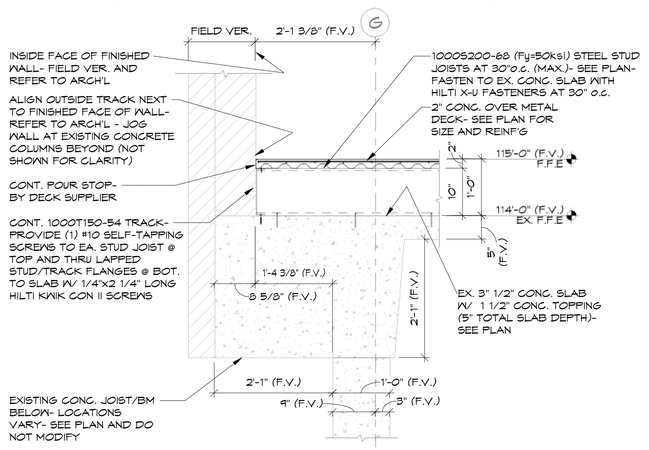
G.C. MAY PROVIDE 1 1/2" DIA. MAX HOLES THRU 10" FLOOR SUPPORT JOISTS FOR M&E CONDUITS. OPENINGS MUST MEET THE FOLLOWING CRITERIA:
1) HOLES MUST BE CENTERED IN THE MIDDLE OF THE 10" JOIST DEPTH (5" FROM TOP OF JOIST)
2) HOLES MUST NOT BE ANY CLOSER THAN 2'-6" TO AN ADJACENT OPENING IN THE SAME JOIST
3) HOLES MUST NOT BE CLOSER THAN 1'-6" FROM THE END OF ANY JOIST.
4) HOLES MUST NOT EXCEED A 1 1/2" DIAMETER.



1 (S601) PLATFORM JOIST FRAMING END
SCALE: 3/4" = 1'-0"



2 (S601) PLATFORM JOIST FRAMING @ RADIUS
SCALE: 3/4" = 1'-0"



3 (S601) PLATFORM JOIST FRAMING @ EXT. WALL
SCALE: 3/4" = 1'-0"

G.C. MAY PROVIDE 1 1/2" DIA. MAX HOLES THRU 10" FLOOR SUPPORT JOISTS FOR M&E CONDUITS. OPENINGS MUST MEET THE FOLLOWING CRITERIA:
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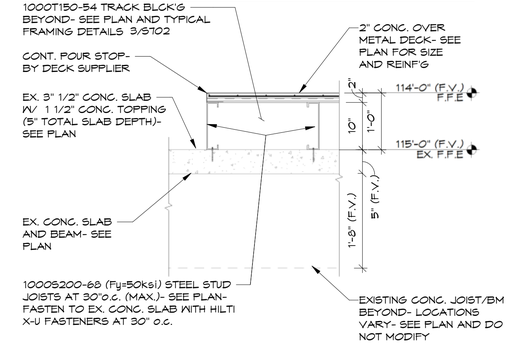
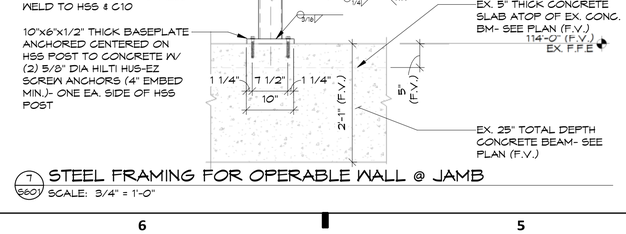
3) HOLES MUST NOT BE CLOSER THAN 1'-6" FROM THE END OF ANY JOIST.
4) HOLES MUST NOT EXCEED A 1 1/2" DIAMETER.

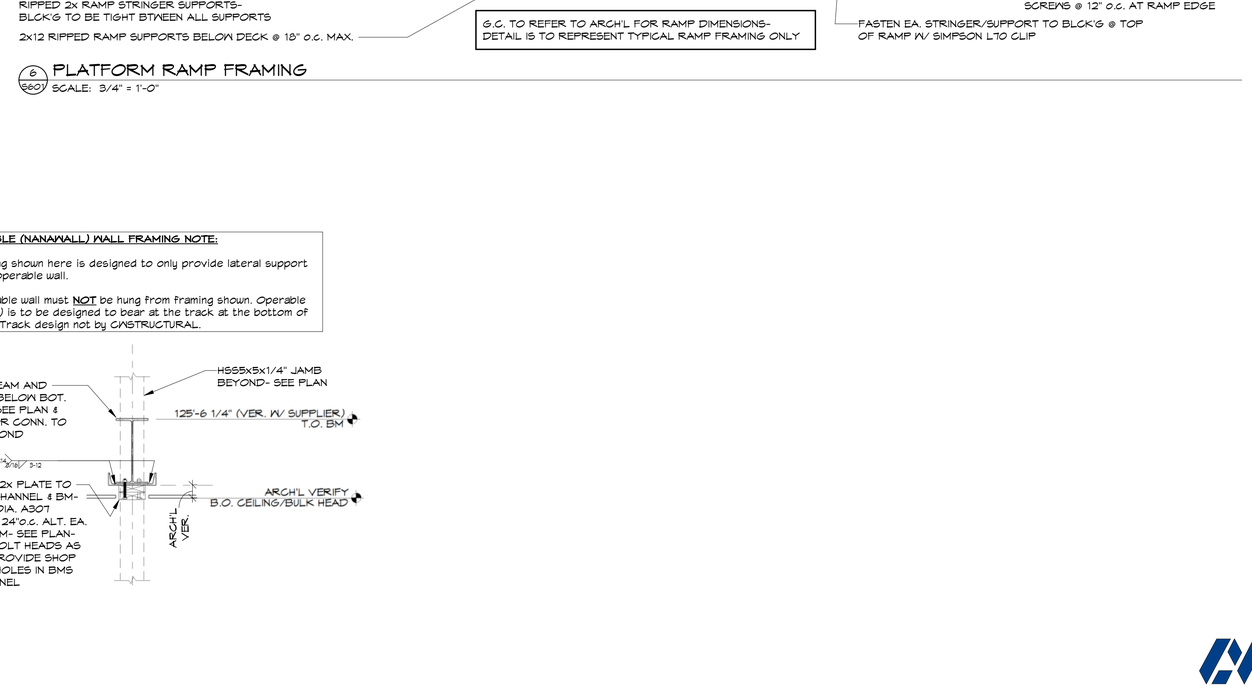


4 (S601) PLATFORM JOIST FRAMING @ SIDE
SCALE: 3/4" = 1'-0"

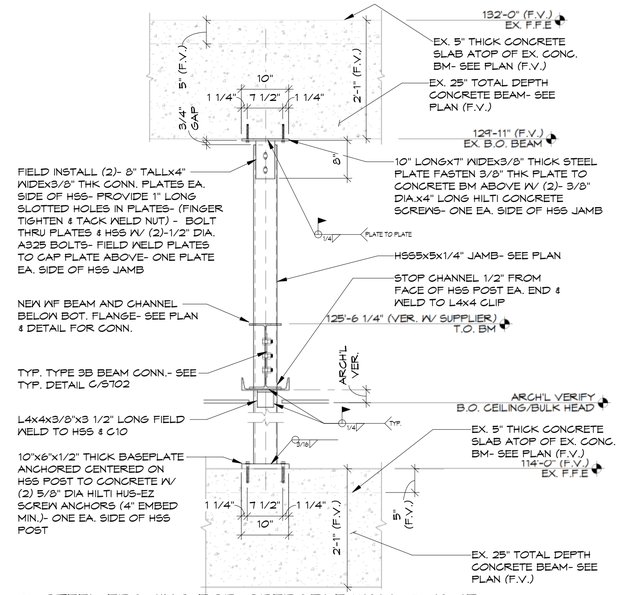
G.C. TO REFER TO ARCH'L FOR STAIR TREAD DIMENSIONS- DETAIL IS TO REPRESENT STAIR TREAD REINFORCING ONLY



5 (S601) PLATFORM STAIR FRAMING
SCALE: 3/4" = 1'-0"



6 (S601) PLATFORM RAMP FRAMING
SCALE: 3/4" = 1'-0"

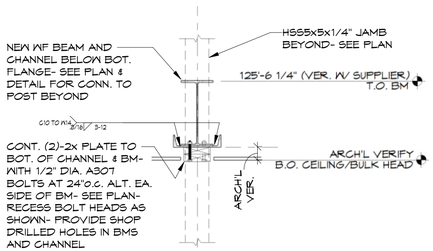


7 (S601) STEEL FRAMING FOR OPERABLE WALL @ JAMB
SCALE: 3/4" = 1'-0"

OPERABLE (NANAWALL) WALL FRAMING NOTE:

1) Framing shown here is designed to only provide lateral support for the operable wall.

2) Operable wall must NOT be hung from framing shown. Operable (nanawall) is to be designed to bear at the track at the bottom of the wall. Track design not by CWSTRUCTURAL.



8 (S601) FRAMING FOR OPERABLE WALL @ HEAD
SCALE: 3/4" = 1'-0"

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CW PROJECT# C2139A
SHEET S601
FLOOR FRAMING DETAILS

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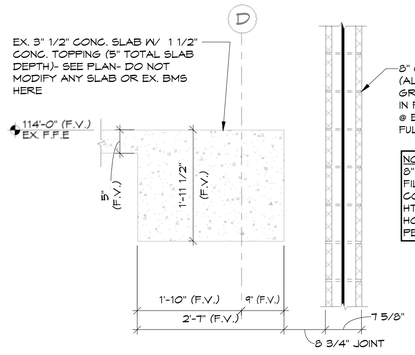
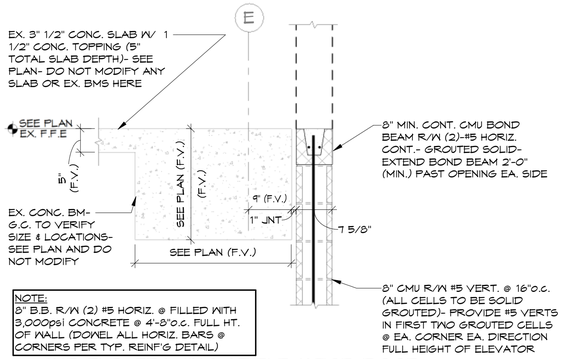
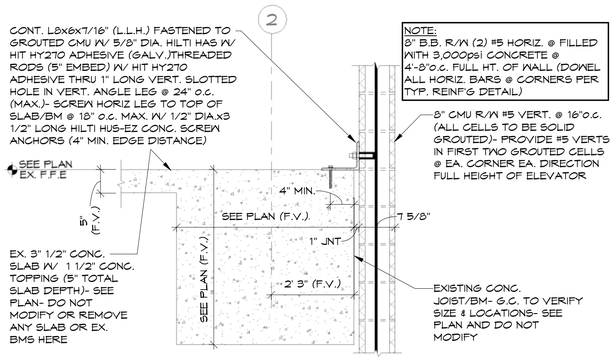


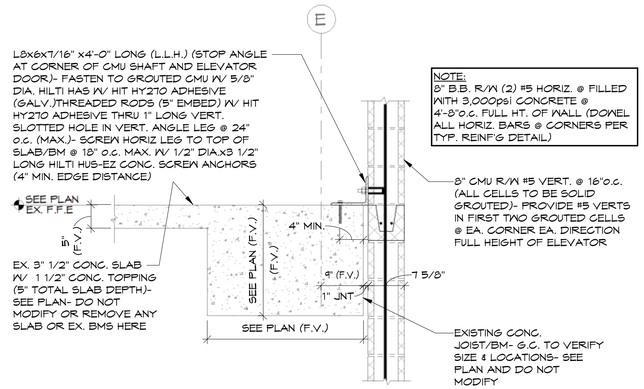
1 S602 — 2ND FLR. FRAMING @ ELEVATOR SHAFT
SCALE: 3/4" = 1'-0"



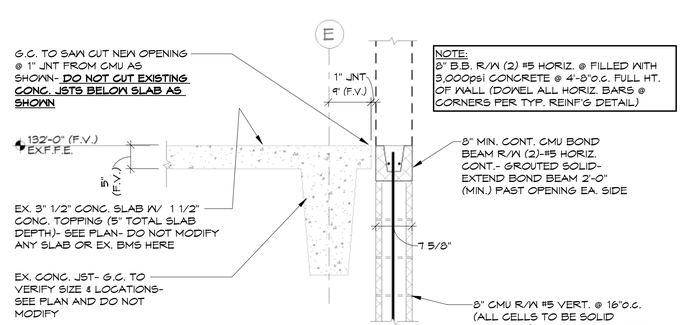
2 S602 — 2ND FLR. FRAMING AT ELEVATOR DOOR
SCALE: 3/4" = 1'-0"



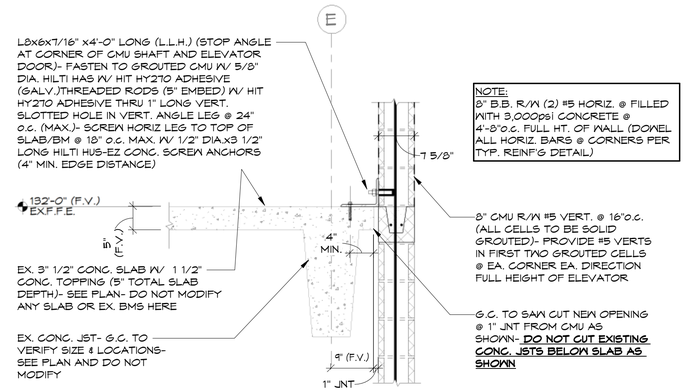
3 S602 — FLR. FRAMING @ ELEVATOR NORTH CMU WALL
SCALE: 3/4" = 1'-0"



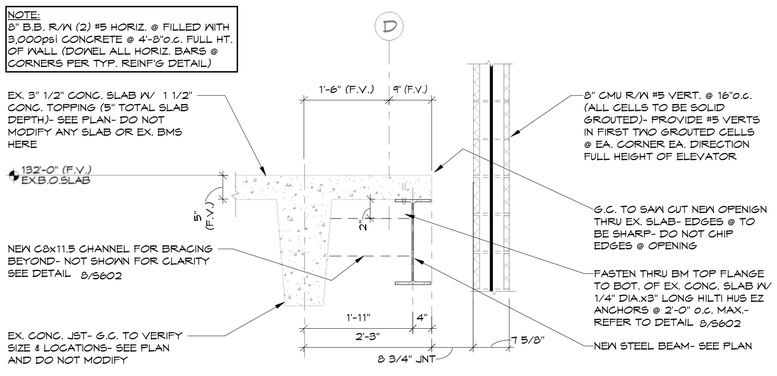
4 S602 — 2ND FLR. FRAMING AT EAST ELEVATOR CMU WALL
SCALE: 3/4" = 1'-0"



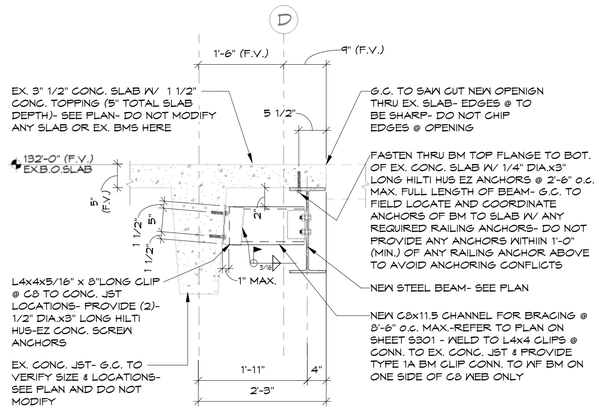
5 S602 — ELEVATOR SHAFT @ THIRD FLOOR ELEV. DOOR
SCALE: 3/4" = 1'-0"



6 S602 — EAST SIDE ELEVATOR SHAFT @ THIRD FLOOR
SCALE: 3/4" = 1'-0"



7 S602 — WEST SIDE ELEVATOR SHAFT THIRD FLOOR
SCALE: 3/4" = 1'-0"



8 S602 — STEEL SUPPORT AT THIRD FLOOR OPENING
SCALE: 3/4" = 1'-0"

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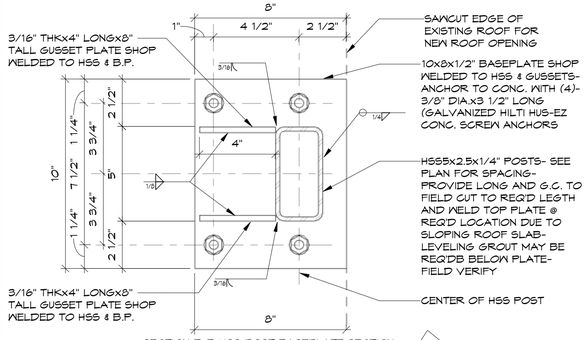
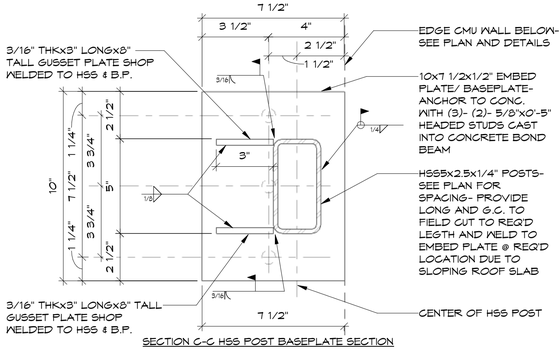
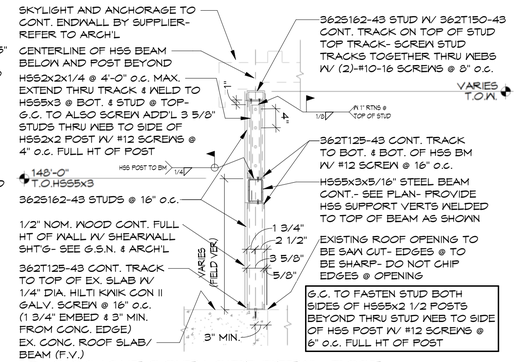


SECTION B-B HSS POST BASEPLATE SECTION

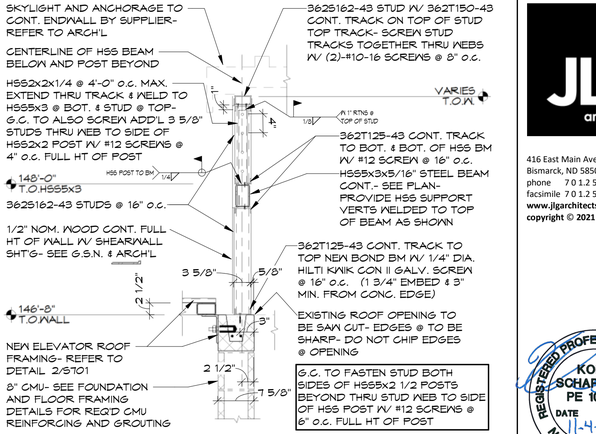


SECTION C-C HSS POST BASEPLATE SECTION



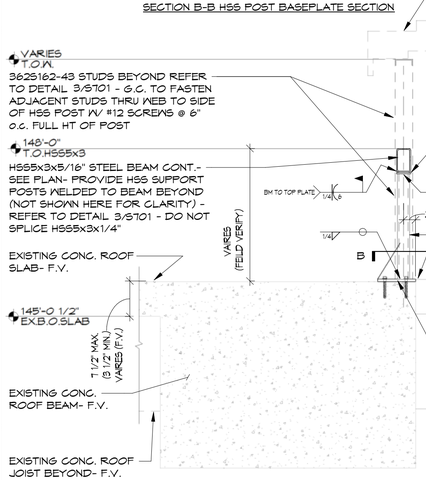
3 S701 SCALE: 3/4" = 1'-0"

SKYLIGHT SOUTH SIDE BETWN POST



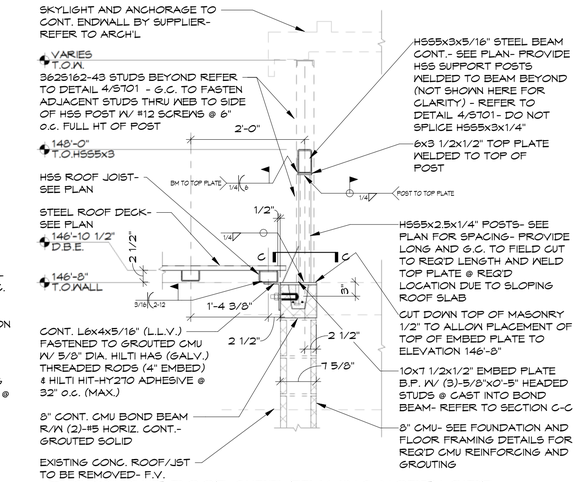
4 S701 SCALE: 3/4" = 1'-0"

SKYLIGHT NORTH ENDWALL BETW'N POSTS



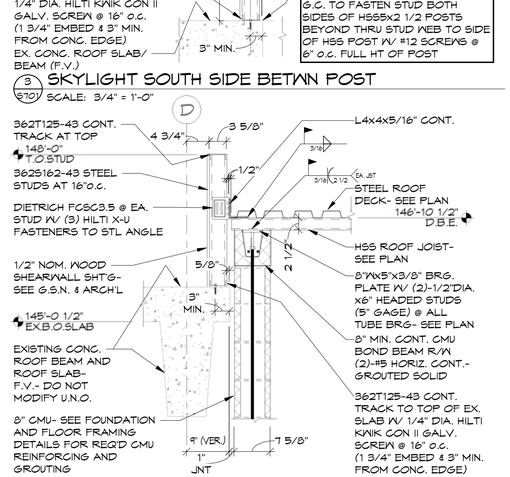
1 S701 SCALE: 3/4" = 1'-0"

SKYLIGHT ROOF ENDWALL FRAMING SOUTH SIDE AT POST



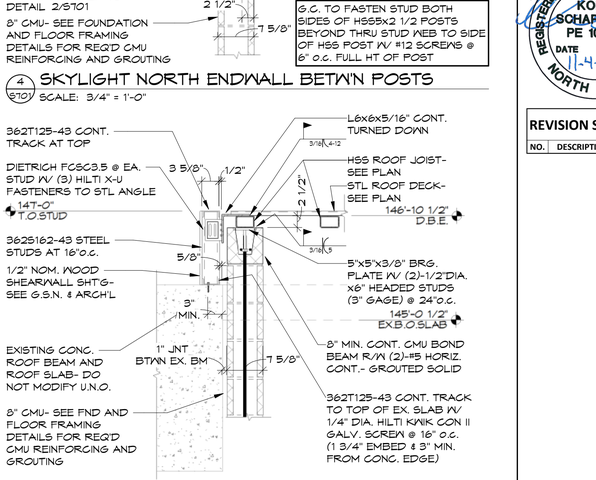
2 S701 SCALE: 3/4" = 1'-0"

SKYLIGHT ROOF CURB FRAMING NORTH SIDE



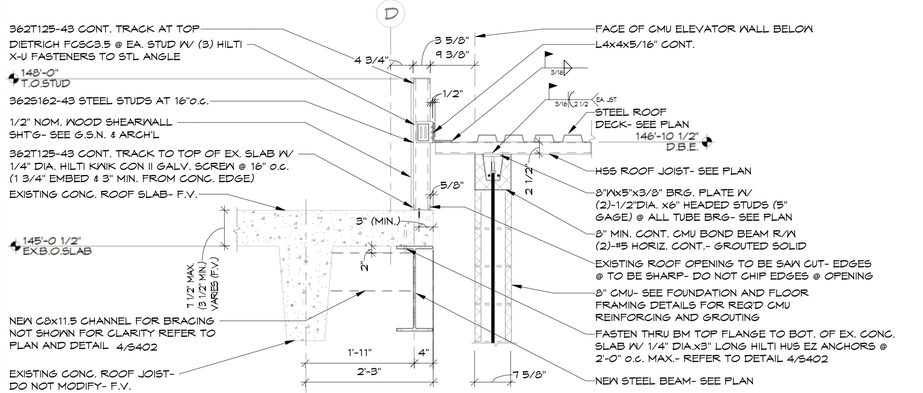
5 S701 SCALE: 3/4" = 1'-0"

ELEVATOR PARAPET AT EX. ROOF



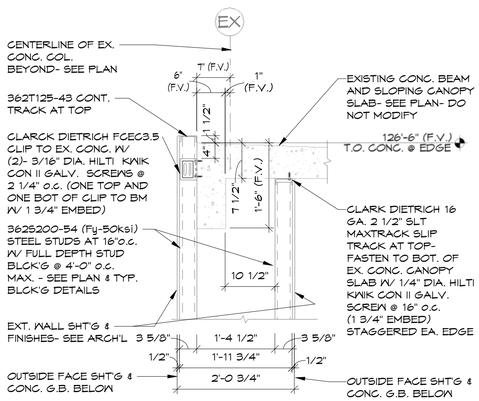
6 S701 SCALE: 3/4" = 1'-0"

ELEVATOR PARAPET



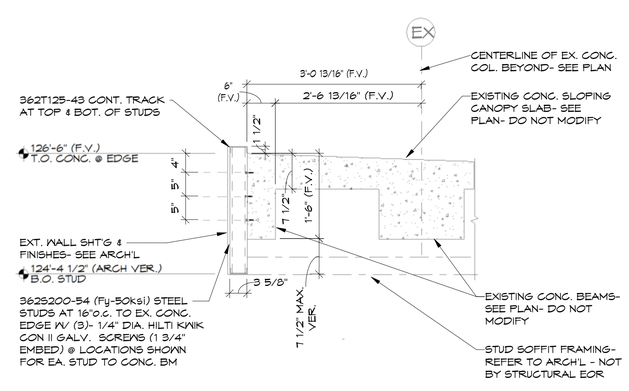
7 S701 SCALE: 3/4" = 1'-0"

ELEVATOR PARAPET AT EX. ROOF & BEAM



8 S701 SCALE: 3/4" = 1'-0"

STUD FRAMING AT SIDE OF EX. CANOPY SLAB



9 S701 SCALE: 3/4" = 1'-0"

STUD FRAMING AT FRONT OF EX. CANOPY

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REGISTERED PROFESSIONAL ENGINEER
KODY SCHAROSCH
PE 10770
DATE 11-4-21
NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY HALL REHABILITATION

CITY OF MINOT
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
CW PROJECT# C2139A
SHEET S701
ROOF FRAMING DETAILS

CW STRUCTURAL ENGINEERS
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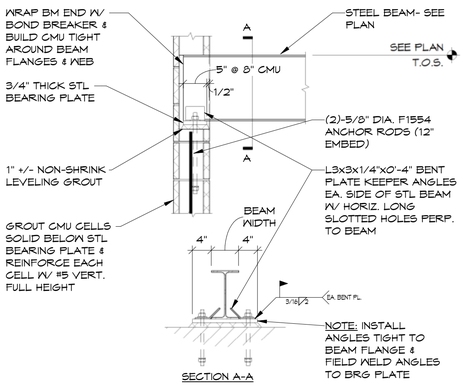
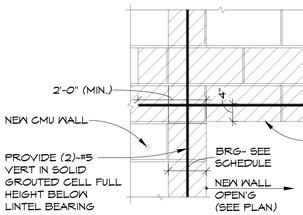


1 S702 TYP. STL BEAM KEEPER PLATE BRG ON CMU
SCALE: 3/4" = 1'-0"



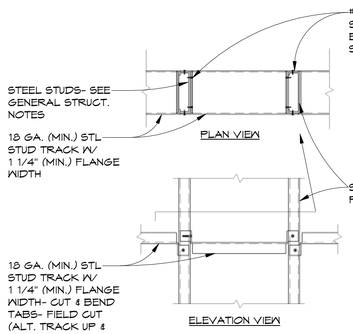
NOTE: G.C. VERIFY LOCATIONS, HEIGHT & WIDTHS OF OPENINGS WITH ARCH'L & MECH'L PRIOR TO HEADER FABRICATION

CMU B.B. HEADER SCHEDULE (REFERENCE ARCH'L & STRUCTURAL):

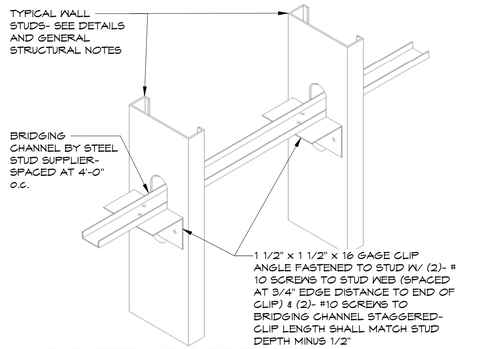
MASONRY BOND BEAM SIZE	BRG LENGTH	SILL (AT DOOR THRESHOLDS)	MAX. ROUGH OPENING
16" DEEP BOND BEAM R/W- (2)- #5 HORIZ. @ TOP & BOT.	8"	16" DEEP BOND BEAM R/W- (2)- #5 HORIZ. @ TOP & BOT.	3'-4"
24" DEEP BOND BEAM R/W- (2)- #5 HORIZ. @ TOP & BOT.	16"	16" DEEP BOND BEAM R/W- (2)- #5 HORIZ. @ TOP & BOT.	5'-0"

NOTES:
1) FILL CELLS SOLID FULL HEIGHT BELOW ALL BOND BEARINGS.
2) REINF'G BAR SIZE INDICATED SHALL BE PROVIDED AS (2)- BARS TOP OF BOT. OF BOND BEAM. BOT. BARS SHALL BE PLACED 4" FROM BOT. OF BOND BEAM & 4" FROM TOP.
3) REFER TO ARCH'L AND STRUCTURAL DRAWINGS FOR OPENINGS IN ELEVATOR WALLS.
4) ALL ARCHITECTURAL OPENINGS ARE TO BE LOCATED 16" MINIMUM LATERALLY FROM ADJACENT ARCH'L WALL OPENGS.

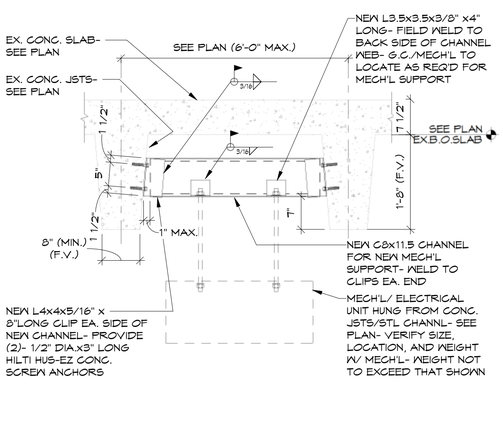
2 S702 TYP. CMU OPENING REINF'G
SCALE: 3/4" = 1'-0"



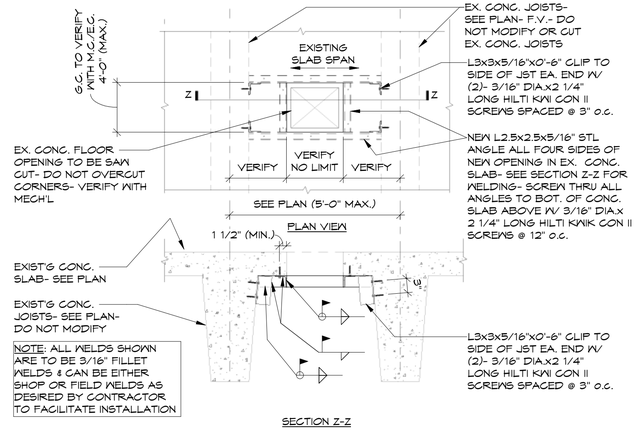
3 S702 TYP. STEEL STUD BLOCKING DETAIL
SCALE: 3/4" = 1'-0"



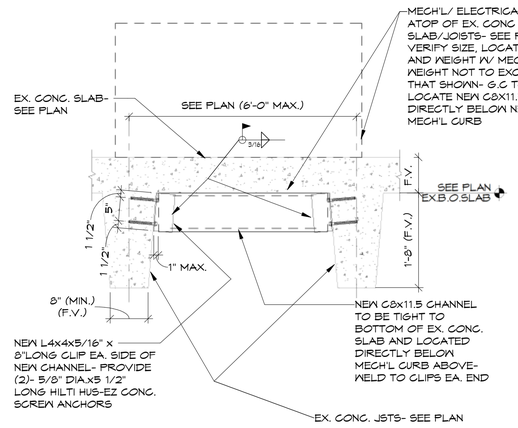
4 S702 TYP. STEEL STUD BRIDGING DETAIL
SCALE: 3/4" = 1'-0"



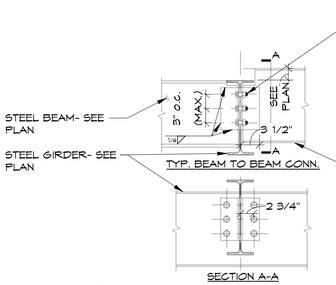
5 S702 HANGING MECH'L/ELEC'L SUPPORT
SCALE: 3/4" = 1'-0"



6 S702 TYPICAL EX. CONC. SLAB OPEN'G FRAMING
SCALE: 3/4" = 1'-0"

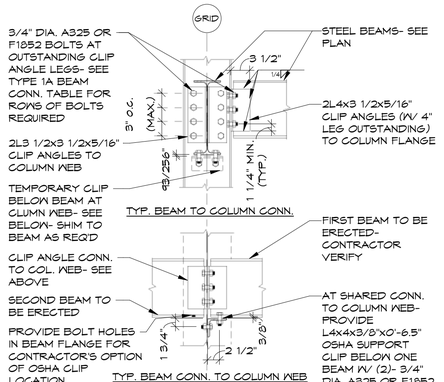


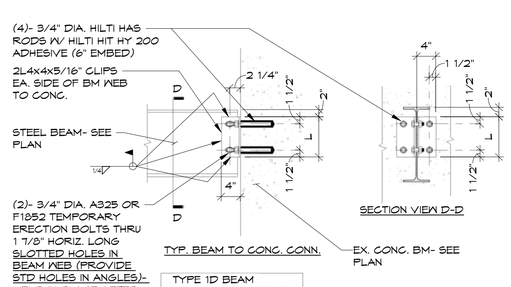
7 S702 SUPPORT BELOW COOLING TOWER CURB
SCALE: 3/4" = 1'-0"



TYPE 1A BEAM CONNECTION TABLE			
BEAM SIZE	NUMBER OF BOLT ROWS	BEAM SIZE	NUMBER OF BOLT ROWS
W10	2 ROWS	W21	5 ROWS
W12	3 ROWS	W24	6 ROWS
W14	3 ROWS	W27	7 ROWS
W16	4 ROWS	W30	8 ROWS
W18	4 ROWS	W33	9 ROWS

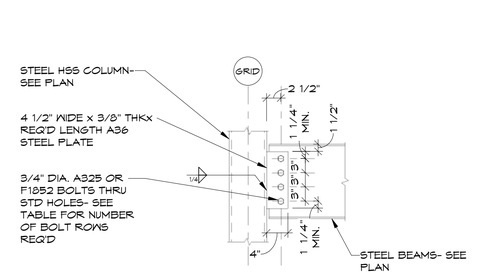
A S702 TYPICAL TYPE 1A BEAM CONNECTION
SCALE: 3/4" = 1'-0"





TYPE 1D BEAM CONNECTION TABLE	
BEAM SIZE	ANGLE LENGTH ("L")
W16	8"
W18	10"
W21	12"
W24	18"

B S702 TYP. TYPE 1D BEAM CONN. NEW TO EX.
SCALE: 3/4" = 1'-0"



TYPE 3B BEAM CONNECTION TABLE			
BEAM SIZE	NUMBER OF BOLT ROWS	BEAM SIZE	NUMBER OF BOLT ROWS
W10	2 ROWS	W18	4 ROWS
W12	3 ROWS	W21	5 ROWS
W14	3 ROWS	W24	6 ROWS
W16	4 ROWS	W27	7 ROWS

C S702 TYP. TYPE 3B STD SINGLE-PLATE BEAM CONN.
SCALE: 3/4" = 1'-0"

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REGISTERED PROFESSIONAL ENGINEER
KODY SCHAROSCH
PE 10770
DATE 11-4-21
NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
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CW PROJECT# C2139A
SHEET S702
TYPICAL FRAMING DETAILS

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GENERAL STRUCTURAL NOTES

GENERAL DESIGN AND CONSTRUCTION:

(1) All work shall comply with the 2018 International Building Code (IBC 2018).

(2) Design Loads:

Project Location: Minot, ND

Wind loads: Per ASCE 7, Exposure Category "C", Iw = 1.0
Basic wind speed (Mapped 3-second gust) = 124 mph (Risk Category IV)

Snow Load: Per ASCE 7 [Also see plan for potential additional snow drifting]
Calculated Roof Snow, Pf = 30 psf
Ground Snow (Mapped), Pg = 35 psf, Is = 1.0, Ce = 1.0, Ct = 1.0

Seismic loads per ASCE 7 (Minot, ND)
Site class = D (Assumed), Ss = 0.049, S1 = 0.02, Ie=1.0
Site coefficient, Fa = 1.6, Site coefficient, Fv = 2.4
Seismic Design Category A

Assumed Total Floor Dead Load = 120 psf
Assumed Total Roof Dead Load = 135 psf
Council Member Raised Platform Dead Load = 35 psf

Typical Floor Live Load = 100 psf
Council Member Raised Platform Live Load = 65 psf

Max. Total Stair Dead Load = 60 psf (By Supplier)
Stair & Ramp Live Load = 100 psf

(3) Specific notes and details shall take precedence over General Structural Notes.

(4) The contract structural drawings and specifications represent the finished structure. Unless otherwise indicated, they do not indicate the means or method of construction. The contractor is solely responsible for the protection of the structure during all phases of demolition, construction and installation. Provide all measures necessary to protect the structure, workers or other persons by means of shoring, bracing and job site safety measures.

(5) Means-and-methods including temporary bracing and shoring against wind and erection is the responsibility of the contractor.

(6) No area of the structure shall be loaded with construction material or equipment that exceeds final design loading indicated.

(7) Verify location of box-outs and openings with mechanical and electrical contractors. Opening sizes and locations shown for pipes, ducts, etc. are for general information only and shall be verified with the mechanical and electrical contractors before commencing with work.

(8) Verify all mechanical and electrical equipment weight and locations with mechanical and electrical contractors and compare with that shown on the drawings. If weights and locations differ from that shown, contact the structural engineer to provide for support.

(9) Holes, pipes, sleeves, etc. through structural framing and foundations that are not shown on the drawings are not acceptable.

(10) Contractor shall provide a cast-in sleeve where drain tile passes through footings or foundation walls.

(11) Structural engineer's seal on the plan does not provide for construction inspection. See requirements in the project specifications for Testing Laboratory services and inspections.

(12) The cost for additional structural engineering services necessitated by contractor requests for an option or due to errors or omissions in construction shall be the contractor's responsibility.

(13) Shop drawings prepared by suppliers, subcontractors, etc. shall be dimensioned, reviewed, coordinated, and signed/stamped by the general contractor prior to submitting to the structural engineer. Manufactured components such as steel stairs shall be engineered and stamped by a licensed Professional Engineer in the state the project is being built prior to submission.

(14) Verify all dimensions and conditions of existing construction to be as shown on the drawings. Advise the Architect and Structural Engineer of variances prior to continuing with construction.

(15) Protect existing construction from damage due to construction of new additions. Make no cuts or alterations to existing construction other than those shown on the drawings without the approval of the Architect and Structural Engineer.

(16) CWSTRUCTURAL may provide periodic observations to assure conformance with design intent of the construction documents. However, these observations are not meant to fulfill the requirements of the IBC required special inspections. CWSTRUCTURAL is not considered a qualified "Special Inspector" as it relates to required building code. Refer to the Special Inspections.

STATEMENT OF SPECIAL INSPECTIONS:

(1) Special inspections and structural testing shall be provided by an independent agency employed by the Owner, unless specified differently in project specifications, for the items identified in this section and in other areas of the approved construction plans and specifications, unless waived by the Building Official (see IBC Chapter 17)

(2) The names and credentials of the Special Inspectors to be used shall be submitted to the Building Official for approval.

(3) Duties of the Special Inspector:
a. The Special Inspector shall review all work listed below for conformance with the approved construction plans and specifications and the IBC.
b. The Special Inspector shall furnish special inspection reports to the EOR, Contractor, Owner and Building Official on a weekly basis, or more frequently as required by the Building Official. All items not in compliance shall be brought to the immediate attention of the Contractor for correction, and if uncorrected, to the EOR and the Building Official.
c. Once corrections have been made by the Contractor, the Special Inspector shall submit a final signed report to the Building Official stating that the work requiring special inspection was, to the best of the Special Inspector's knowledge, in conformance with the approved construction plans and specifications as well as the applicable workmanship provisions of the IBC.

(4) Duties and responsibilities of the Contractor:
a. The Contractor shall submit a written statement of responsibility to the Owner and the Building Official prior to the commencement of work. In accordance with IBC 1704.4, the statement of responsibility shall contain acknowledgement of the special inspection requirements contained within the "Statement of Special Inspections".
b. The Contractor shall notify the responsible Special Inspector that work is ready for inspection at least one work day (24 hours minimum) before such inspection is required.
c. All work requiring special inspection shall remain accessible and exposed until it has been observed by the Special Inspector.

(5) **REQUIRED SPECIAL INSPECTIONS (Per IBC 2018)**:

CONCRETE (IBC Section 1705.3): Special inspections to be performed per "Required Special Inspection of Concrete Construction" table located within these construction documents and also called out in the IBC table 1705.3. (Exception: Special inspections are not required for concrete in the following cases:
1) Concrete patios, driveways and sidewalks, on grade.)

COLD-FORMED STEEL LIGHT-FRAMED CONSTRUCTION (IBC Section 1705.11.2 & IBC Section 1705.11.3): *Periodic* special inspection is required for welding operations of elements of the main windforce-resisting system. *Periodic* special inspection is required for screw attachment, bolting, anchoring, and other fastening of elements of the main windforce-resisting system, including shear walls, diaphragms, drag struct, braces, and hold-downs.

WIND-RESISTING COMPONENTS (IBC Section 1705.11.3): *Periodic* special inspection is required for fastening of the following systems and components:
1.) Roof coverings, roof deck, and roof framing connections.
2.) Exterior wall covering, and wall connections to roof and floor diaphragms and framing.(i.e. Steel Studs, CMU walls, etc.)

SOIL (IBC Section 1705.6): Special inspections to be performed per Table 1705.6 located both in the IBC and within these construction documents.

STRUCTURAL STEEL (IBC Section 1705.2, 1705.11, & 1705.12, and AISC 360): Special inspections to be performed per "Required Special Inspection of Structural Steel" table located within these construction documents and also called out in the IBC & AISC.

MASONRY (IBC Section 1705.4 & TMS-402/ACI 530): Special inspections to be performed per "Required Special Inspection of Masonry" table located within these construction documents and also called out in the IBC & ACI 530.

HELICAL PILE FOUNDATIONS (IBC Section 1705.9): *Continuous* special inspection shall be performed during installation of helical pile foundations. The information recorded shall include installation equipment used, pile dimensions, tip elevations, final depths, final installation torque, and other pertinent installation data as required by the registered design professional in responsible charge. The approved geotechnical report and the construction documents prepared by the registered design professionals shall be used to determine compliance.

(6) Please see the "Special Inspection Schedules/Tables" for the types, extents and frequency of specific items requiring special inspections and structural tests as part of this project. Inspections and testing indicated in the special inspection tables are guidelines to the required inspection and testing required by the building code for the particular building. The IBC and referenced testing/inspection standards shall be reviewed and followed by the inspecting agency to ensure that all required testing/inspection and procedure for testing/inspection is achieved.

FOUNDATIONS:

(1) Assumed Geotechnical Design Values – All concrete foundation designs are based on assumed geotechnical design values to be confirmed by a geotechnical engineer. All foundation excavations must be observed and all assumed design values stated below shall be verified in writing by a licensed geotechnical engineer following on-site observation prior to fabricating steel and placing concrete any concrete. All assumed geotechnical design values are as follows:

A. Minimum Soil Bearing Capacity = 1500 psf
B. Backfill Soil Unit Weight (γ) = 110 pcf (dry)
C. Maximum Lateral Pressure Values (Granular Backfill with Draintile):
1. Active Pressure: 41 pcf
2. At-Rest Pressure: 60 pcf
3. Passive Pressure: 250 pcf
4. Coefficient of Friction (Concrete on Soil): 0.35

(2) All footings shall bear on natural, undisturbed soil. All natural bearing material shall be approved in writing by a licensed Geotechnical Engineer prior to placing footing concrete.

(3) All seepage shall be continuously pumped from excavations until the Geotechnical Engineer of Record determines such seepage no longer impacts the bearing soils or Engineered Fill or construction of footings and floor slabs.

(4) Positive drainage shall be obtained away from the structures and care required for backfilling and drainage of utility trenches during construction shall be provided per the Geotechnical Report and the Civil drawings.

(5) Excavations shall be performed in accordance with all governing safety regulations including OSHA. There shall be no surcharge load from vehicles, equipment, materials, soil piles etc. near the crest of the excavation slopes per the Geotechnical Report. The responsibility for excavation safety and temporary construction slopes lies solely with the Contractor.

(6) A 6" thick aggregate base course acting as a capillary break and a vapor barrier shall be placed below all interior slabs-on-grade per the Geotechnical Report and the project specifications. A minimum 15 mil vapor barrier shall be placed on top of the aggregate base and directly below the slab with all seams overlapped a minimum of 6" and taped. The slab shall be properly cured as indicated in these General Structural Notes and the project specifications as well as per the recommendations of the ACI to avoid curling.

(7) Clean footing excavations of snow, water, mud, loose soil and debris prior to placing footing concrete.

(8) Footings may not be earth formed.

(9) All footings are centered under the piers, columns or walls they support, except as noted otherwise.

(10) Excavations and backfill shall be executed and tested in accordance with the project specifications and soils report.

(11) Footing excavations shall be to proper line and level to insure minimum concrete cover of footing reinforcement for footing depth.

(12) Backfill shall be compacted by mechanical means.

(13) Backfill shall not be placed against basement walls until walls have been adequately braced either temporarily or permanently with new construction fully installed at the top and base of the walls, the concrete has attained sufficient strength to resist lateral pressure and has adequate durability.

(14) Place all backfill according to the project specifications. General contractor is required to temporarily brace all walls as required prior to and during the placing of backfill and until permanent support for the top and base of the walls are completely constructed.

(15) Protect all foundations from the action of water and freezing.

(16) See mechanical, electrical and architectural drawings for all openings and inserts not shown on the structural drawings. All openings and inserts shall be placed prior to casting concrete.

(17) Non-frost susceptible granular fill is to consist of granular material with less than 5% passing the #200 sieve and no more than 40% passing the #40 sieve.

HELICAL PILES

(1) Helical piles are to be designed by the helical pile supplier for a gravity axial compression load of 20 kips and an uplift axial tension load of 10 kips unless indicated otherwise on the structural drawings.

(2) Helical piles and their anchorage to the foundation system shall be capable of safely resisting the applied loads indicated on the plans.

(3) Anchorage of helical piles to the foundation system shall be by the helical pile supplier with general configuration as indicated on the plans.

(4) Helical piles shall be designed by a registered professional engineer in the state the project is being constructed. Stamped design shall be submitted to the structural engineer for approval prior to placing helical piles.

(5) Helical pile component and accessory steel finish shall be shop galvanized to a level appropriate for project conditions unless noted otherwise on the plans.

(6) All helical piles must be installed by an experience installer whom meets the following criteria.
a. Manufacturer's certificate of competency in installing helical piles.
b. List of three or more similar projects completed within the previous three years and names of representatives who can verify such participation.
i) If an installer does not have direct experience of three or more projects with a helical pier (from the approved manufactures list), they must provide written documentation of a secondary company, whom does meet the previous experience requirements, who will oversee the installation procedure from start to finish.
ii) The secondary company (experienced installer) will act as the contractor, responsible-in- charge for all helical's installed on site.
iii). The secondary company is to be responsible for maintaining a supervisor on site during the entire installation of the helical foundations.
iv) The secondary (overseeing) company will need to take on all liabilities for installation requirements (including but not limited to depths, torques, locations, battering, etc.)
v) If the installer would like to become a future approved installer, they must receive certifications, along with letters of recommendations which illustrate a level competence for a total of 3 projects within a 3 year span.
c. Letter from manufacturer stating ability and intent to provide on-site supervision.
d. List of all safety violations lodged against installer within previous three years and current status/final resolutions thereof.

(7) If the original installer bid was awarded and they cannot meet any of the design or installer qualifications, during construction or the shop drawing review phase, the original awarded installer may be liable for any or all costs associated to construction schedule delays.

CONCRETE:

(1) Concrete mix design(s) shall be by an independent testing laboratory and shall be submitted to the Architect and Structural Engineer for approval at the responsibility of the General Contractor.

(2) Concrete Mix Designs:

Footings are to have a concrete mix design consisting of Portland Type I/II cement (5 sack min.) and a 28-day compressive strength of 3000 psi, 25% max fly ash allowed, 1 1/2" max aggregate size, 4" max slump, 0.50 max water-to-cement ratio, no air entrainment, water reducing admixture ok.

Interior Concrete Walls are to have a concrete mix design consisting of Portland Type I cement (6 sack min.) and a 28-day compressive strength of 4000 psi, 25% max fly ash allowed, 3/4" max aggregate size, 4" max slump, 0.45 max water to cement ratio, no air entrainment, water reducing admixture ok, mid-range plasticizer with prior approval.

Grade Beams are to have a concrete mix design consisting of Portland Type I/II cement (6 sack min.) and a 28-day compressive strength of 4000 psi, 25% max fly ash allowed, 3/4" max aggregate size, 4" max slump, 0.45 max water-to-cement ratio, 5% to 7% air entrainment, water reducing admixture ok, mid range plasticizer ok, super plasticizer requires prior approval.

Interior Slabs-on-Grade are to have a concrete mix design consisting of Portland Type I/II cement (5 sack min.) and a 28-day compressive strength of 3000 psi, 25% max fly ash (Note: fly ash will retard initial set time), 3/4" max aggregate size, 4" max slump, 0.48 max water-to-cement ratio, no air entrainment, water reducing admixture ok, mid range and super plasticizer requires prior approval.

Elevated Floor Slabs on Metal Decking are to have a concrete mix design consisting of Portland Type I cement (6 sack min.) with a 28-day compressive strength of 4,000 psi, 3/4" max aggregate size, 3" max slump, 0.45 water-to-cement ratio, no air entrainment, mid-range or super plasticizer required (slump test taken prior to adding plasticizer – no additional water after slump test and plasticizer.

Flowable Fill Concrete (Controlled Density Fill - CDF) is to have a minimum compressive strength of 150 psi and a maximum strength of 200 psi and is to consist of water, portland cement, fine aggregate and flyash to be self-leveling not needing vibration or compaction with a density of 100 to 125 pcf.

Precast Topping & Fill for Steel Pan are to have a concrete mix design consisting of Portland Type I cement (5 ½ sack min.) and a 28-day compressive strength of 3000 psi, 25% max fly ash allowed, 3/8" max. aggregate size (or ¼" for spaces less than 3/4"), 4" max slump, 0.55 max water-to-cement ratio, no air entrainment, water reducing admixture ok, Super plasticizer requires prior approval.

Masonry Core Fill Grout, Bond Beams and Masonry Lintels are to have a concrete mix design consisting of Portland Type I low alkali (5 sack min.) and a 28-day compressive strength of 3000 psi, 25% max fly ash, 1/4" to 3/8" max aggregate size, 7" max slump, 0.62 max water-to-cement ratio, 4%-6% air entrainment, water reducing admixture ok, mid-range plasticizer ok.

Exterior exposed elevated slabs (stoop slabs) are to have a concrete mix design consisting of Portland Type I/II cement (6 sack min.) and a 28-day compressive strength of 4,500 psi, 30% max fly ash (Note: fly ash will retard initial set time), 3/4" max aggregate size, 3" max slump, 0.41 max water-to-cement ratio, 5% to 7% air entrainment, water reducing admixture ok, mid range ok, super plasticizer requires prior approval.

Grout for steel base plates and bearing plates is to be of the non-shrink non-metallic type meeting ASTM C1107 with a maximum slump of 3" and a minimum 28-day compressive strength of 5000 psi. Follow manufacturer's directions for use.

(3) Concrete aggregate shall meet ASTM C33 with a maximum shale or deleterious material content of 1%.

(4) Portland cement shall meet ASTM C150 and shall be low Alkali.

(5) Fly Ash of "Type C meeting Class F" may be substituted by weight for cement up to maximum limits indicated in each concrete mix design.

(6) Mid-Range Plasticizer meeting ASTM C494 Type D is acceptable if noted in mix design. Mix is to have a maximum slump as indicated above for the particular mix design prior to adding the Mid-Range. Adjust air content as required by the supplier due to the use of the Mid-Range and its projected effect on the air content. Test for air after Mid-Range addition to achieve range specified. Slump is to be tested to meet that specified above for particular mix design prior to adding Mid-Range Plasticizer and no additional water may be added after slump test.

(7) Air Entraining agents shall meet ASTM C260.

(8) Concrete construction shall conform to the ACI building code requirements for reinforced concrete, ACI 318.

(9) Hot Weather Concreting per ACI 305R and Cold Weather Placement per ACI 306R shall be followed where weather conditions warrant.

(10) Slabs shall be cured with a curing compound as indicated in the specifications and per the recommendations of the ACI code relative to exposure to sunlight, wind, temperature, etc.

(11) Forms shall be left on all walls for a minimum of 2 days or longer as required at the discretion of the contractor.

(12) A continuous bond break, such as 3/8" asphaltic fiber board expansion joint material, shall be placed between the concrete slab and the perimeter foundation walls.

(13) All concrete pours shall be tested for strength (per ASTM C31 and C39), slump and air content. Test one cylinder at 7 days, one at 14 days, two at 28 days and hold one cylinder.

(14) All concrete reinforcing shall meet ASTM specification A615, Grade 60.

(15) Reinforcing steel shall be bent and placed in accordance with the ACI code. All tension splices shall be class 'B', 48 bar diameters, minimum. All compression splices shall be 40 bar diameters (minimum), unless noted otherwise. Lap all corner bars.

(16) Provide adequate support bars and accessories to hold all rebar firmly in place.

(17) All slabs are to be reinforced with bars located as called out on structural drawings. G.C. must use rebar support chairs to hold all slab bars firmly in their required location during pouring. Chairs are to be placed frequently enough to ensure no more than 1/4" of sag is present in any reinforcing bars.

(18) Concrete cover for reinforcing shall be per ACI 318.

(19) Slabs-on-grade are to be reinforced as shown on plans and details. Place slabs with construction and contraction joints per details.

(20) Openings in concrete shall be reinforced with (2)- #5 bars each side, extending 30" past the face of the opening unless otherwise noted.

(21) Interior concrete slabs-on-grade must not be allowed to freeze after pouring. Subgrade soil temperature beneath interior slabs-on-grade must be maintained above freezing at all times after pouring. Concrete shall not be poured on frozen soils.

(22) All reinforcing specified for interior slabs-on-grade and elevated slabs shall be supported adequately and firmly on chairs to maintain the clear distances specified.

(23) No electrical conduits or other piping shall be directly attached to the reinforcing steel or otherwise suspended within in concrete slab-on-grade or elevated slabs nor shall conduit or piping of any kind be placed on top of metal formdeck or composite decking. All conduit or piping must be attached to the underside of the slab/decking after the concrete has been cast and cured and shall penetrate the slab/decking at planned locations. See plans and typical details for penetrations in elevated slabs.

(24) All vertical wall and pier bars must be extended to within 2" of the top of foundation walls unless shown otherwise on the drawings. All horizontal foundation wall bars must be placed within 4" of the top and bottom of the wall unless shown otherwise.

(25) All epoxy-set rebar doweling to concrete shall be HILTI HIT-HY 200 Safe Set System with HILTI Hollow Drill Bit System, except as noted otherwise. Install per manufacturer's recommendations.

MASONRY:

(1) Concrete masonry units shall have a compressive strength greater than or equal to f'm=1,500 psi. Special inspection is not required.

(2) Grade 60 reinforcing steel shall be used complying with ASTM A615. Wire ladder-type joint reinforcement (Dur-o-wall) consisting of (2)- #9 galvanized wires shall be used horizontally at 16" o.c. in all masonry bearing wall construction. Joint reinforcement shall be standard width for the wall it is reinforcing and shall comply with IBC Standards.

(3) Concrete fill for unit masonry cores and bond beams shall have a 28 day compressive strength of 3,000 psi.

(4) Grout shall be proportioned and tested according to IBC Standards.

(5) Masonry walls shall be constructed in accord with ACI 530 (Building Code Requirements and Specifications for Masonry Structures), following all minimum requirements for reinforcing, quality of construction, etc.

(6) Minimum reinforcing shall be provided per ACI-530 section 7.3.2.3.1. Minimums include: vertical reinforcing of at least 0.2 square inches shall be provided at all corners, within 16" of each side of openings, within 8" of each side of movement joints, within 8" of the ends of walls and at a maximum spacing of 120" on center unless noted otherwise on structural drawings.

(7) Masonry cells to be filled with concrete grout shall be filled in lifts of 4'-0" maximum height. All overhanging mortar obstructions and debris shall be removed from the cell prior to grouting. Grouting shall be performed prior to placing of any sand in masonry walls.

(8) Masonry face shells and cross webs forming cells to be filled with concrete grout shall be full bedded in mortar to prevent leakage.

(9) Consolidate all concrete grout by puddling or vibrating.

(10) Masonry control joint spacing shall not exceed 40 feet.

(11) Vertical reinforcement shall be placed and secured against displacement prior to grouting by wire positioners or other suitable devices at intervals not to exceed 200 bar diameters or 10 feet maximum, or at bar splice locations.

(12) Vertical reinforcing bars shall be held in position at top and bottom and at 192 bar diameter intervals maximum.

(13) Lap all reinforcing a minimum of 40 bar diameters with a minimum lap of 24". Joint reinforcement shall lap a minimum of 6".

(14) Horizontal reinforcement shall be continuous at all corners and at intersecting walls. Provide corner bars with the required lap splice length.

(15) All masonry walls are to be supported laterally until the entire roof(s) or floor(s) is in place as detailed.

STRUCTURAL STEEL:

(1) Structural steel work is to be per AISC specifications. Steel grade shall be ASTM A992 (Fy=50 ksi) for wide flange shapes, ASTM A500, Grade B (Fy=46 ksi) for cold-formed steel tubes and ASTM A36 (Fy=36ksi) for other shapes except as noted otherwise on the drawings.

(2) Beams and columns shall be erected true and plumb. Provide temporary bracing.

(3) Bearing plates for steel beams and columns shall be dry packed with dry grout as specified.

(4) All bolts in structural steel connections shall be ASTM F3125, Group A, standard heavy hex head or twist-off tension control (TC) High-Strength bolts, except as noted otherwise.

(5) All anchor rods for structural steel stair columns shall be ASTM F1554, Grade 36 (Fy=36ksi) threaded rod with a nut on the embedded end as indicated on the drawings.

(6) All screw anchors shall be carbon steel HILTI KWIK HUS-EZ, except as noted otherwise. Where anchors are exposed to exterior weathering or as noted on drawings, Hilti KWIK HUS-EZ anchors are to be galvanized. Install bolts per manufacturer's recommendations with bolt embedment depth into concrete as indicated on structural drawings.

(7) All epoxy-set threaded rod anchorage to concrete shall be HILTI HIT-HY 200 Safe Set System with carbon-steel anchors (Anchors are to consist of 'HAS-B-105' (Fy=105 ksi) threaded rod material meeting ASTM 193, Grade B7 placed in holes cleaned with the Hilti Hollow Drill Bit System, except as noted otherwise). Install per manufacturer's recommendations with bolt embedment depth into concrete as indicated on structural drawings. Contractor is to provide heat as required to maintain minimum required concrete base material temperature per supplier recommendations during epoxy curing.

(8) All epoxy-set threaded rod anchorage to hollow cmu or multi-wythe masonry shall be HILTI HIT-HY 270 Masonry Adhesive Anchoring System with 'Super HAS' threaded rod material meeting ASTM 193, Grade B7, except as noted otherwise. Provide appropriate size/length screen tube for proper anchorage and install bolts per manufacturer's recommendations. Contractor is to provide heat as required to maintain minimum required base material temperature per supplier recommendations during epoxy curing.

(9) No field welds are to be made until the members are properly aligned. Field welds are to be made by competent certified welders using proper electrodes and amperage.

(10) Bolts with an indicated pretension load (shown on details) in moment beam-to-column connections and in hanger connections for partition wall supports shall be pretensioned to loads indicated on the details. All bolts in 50% of the connections shall be field tested by an independent testing agency using the Calibrated Wrench method as outlined in the AISC Specification for Structural Joints. The wrench shall be shop calibrated with a Skidmore by the independent testing agency. All bolts not meeting the required pretension shall be re-tightened and re-tested at the General Contractor's expense.

(11) All structural steel stairs shall be designed for a maximum member Live Load deflection = L/600 along the member span or a maximum deflection of 3/8" whichever is less. All steel stairs shall be designed by the stair supplier with shop drawings sealed by a licensed Professional Engineer in the State the project is being built prior to submission.

(12) Exterior exposed steel support framing (such as rooftop mechanical & screenwall support framing, etc.) shall be painted with exterior weather resistant paint. Paint shall have a minimum applied dry thickness of 6 mils total, which includes primer, mid-coat, and top-coat. Paint over connections and do not disassemble structural framing. Steel fabricator to coordinate shop & field painted coats with contractor. Refer to arch'l for additional paint requirements

STEEL DECKING:

(1) Metal deck is to be manufactured and erected in accordance with the Steel Deck Institute (SDI) specification.

(2) 1 1/2" steel roof decking is to have a minimum design yield strength of Fy=33 ksi and shall be fastened with support fasteners of #12 Tek screws in an SDI 36/7 fastener pattern at end members & interior supports. Also provide three #10 TEK screw sidelap fasteners at each span, except at the deck lap edge along the roof perimeter where standard support fasteners are to be provided to the perimeter steel supports.

(3) 0.6" (1/2" nominal) non-composite steel floor decking shall be fastened to supporting members with powder-actuated fasteners in an SDI 30/4 fastener pattern and at sidelaps with zero #10 TEK screw sidelap fasteners. Powder-actuated fasteners at supports are to consist of Hilti X-ENP19 L15 pins for steel thicker than 1/4" and Hilti X-EDNK22-THQ12 pins for steel thinner than 1/4". Substitutions require approval from the structural engineer. (Note: #10 TEK screw sidelap fasteners are required at midspan or a maximum of 36" o.c. for deck spans greater than 5 feet).

(4) Steel deck panel ends must overlap a minimum of 2". End lap and corner lap conditions must be snug and tight to one another and the supporting steel frame prior to frame fastener attachment.

(5) Powder-actuated deck fasteners may be substituted for indicated Tek screws at supports with approval of structural engineer of record. Powder actuated fasteners are to consist of Hilti X-ENP-19 L15 pins for steel thicker than 1/4" and Hilti X-HSN 24 pins for steel between 1/8" and 3/8" thick. Substitutions require approval from the structural engineer. Sidelap fasteners are to be provided as originally indicated at deck sidelaps and at perimeter deck edges.

(6) 5/8" diameter puddle welds may be substituted for indicated Tek screws at supports decking supports (welding washers are required for decking less than 0.028" thick). Stitch welds per the deck manufacturer's recommendations can be substituted for sidelap screw fasteners, though stitch welds are not to be used for deck less than 0.028" thick. All fastenings shall be made per the steel deck and mechanical fastener manufacturer's recommendations and specifications.

(7) Where sidelap fasteners are required, all sidelap fasteners at building or roof perimeter shall have 4" long steel tube or plate shims provided at each fastener location where a continuous deck edge angle or steel framing members is not provided at deck bearing elevation. Desired shop welding versus field welding of the shims to support steel shall be coordinated with the contractor.

(8) "Z" closure & cell closure strips are to be provided by the deck manufacturer as required at all composite concrete floor slabs.

(9) 9"x20 gage galvanized flat plate is to be provided by the deck manufacturer at all changes in roof deck span direction. Fastening of the flat plates to the metal deck on each side of the deck transition joint is to be as indicated on the structural drawings and details.

SLAB STUD SHEAR CONNECTORS:

(1) Steel headed stud shear connectors shall be equal to type S3L by Nelson Stud Welding and meet material specification ASTM A108, Grade 1015 through 1020 for steel.

(2) Steel headed stud anchors are to be visually inspected to show a full 360 degree weld fillet, although not necessarily the same fillet height around the circumference of the stud. Any under cut at the weld interface will be cause for rejection. If the fillet circumference is less than 360 degrees, complete the fillet by hand welding. Studs failing initial visually inspection should then be tested after repairs are made by bending the stud 15 degrees from their original axis, either by striking with a hammer or placing a pipe over the stud and manually or mechanically bending the stud. If failure does not occur, the weld should be considered good. If the weld fails, the stud should be replaced. (See AWS D1.1, Section 7.8.1).

COLD-FORMED METAL FRAMING (GENERAL):

(1) Cold-formed framing members are to be provided as indicated on the structural drawings per standard nomenclature established by the American Iron and Steel Institute (AISI) identifying size, type and thickness of each member (studs, tracks, etc.)

(2) Prior to ordering, fabrication, and installation of cold-formed framing, the contractor shall submit manufacturer's product data of the cold-formed members and clips to the Architect and Structural Engineer for approval.

(3) Structural framing members shall be properly spaced, plumbed, leveled, squared, fit properly against abutting members and held securely in place until permanently fastened. Wire tying of structural framing members is not permitted.

(4) Factory punch-outs are to be located along the centerline of the member web with a minimum center-to-center spacing of 24"o.c. Punch-outs are to have a maximum width equal to the lesser of half the member depth or 2 1/2", and a maximum length of 4 ½".

(5) Structural framing shall have a minimum 1 1/2" end bearing and a minimum of 10" unpunched web measured from the end of the member to the edge of the web punch-out.

(6) Fastening of framing components shall be by screws, powder actuated fasteners, welding or a combination of methods. The type, size, and spacing of fasteners shall be per manufacturer's recommendations, except as noted otherwise on the contract documents.

(7) All welded connections shall be made with the latest recommendations of AISI (American Iron and Steel Institute) and the AWS (American Welding Society).

(8) Structural framing members having protective coating removed by welding or other fastening method shall have the coating repaired by painting with a zinc-rich primer.

(9) Structural framing tracks shall have web in contact with a uniform and level bearing surface and be securely anchored as specified in the contract documents or approved connection details.

(10) Temporary bracing of wall framing shall be provided by the contractor and removed only after permanent bracing is installed.

COLD-FORMED METAL COUNCL CHAMBER FLOOR JOIST FRAMING:

(1) Structural framing joists shall be located, spaced, supported, and installed per the contract documents or approved shop drawings.

(2) Structural framing joists shall have a minimum 1 1/2" end bearing and a minimum of 10" unpunched web measured from the end of the member to the edge of the web punch-out.

(3) Provide additional framing around openings that exceed the normal spacing of the joists. Provide blocking (anchored at each end) the same size and gage as the joists at all sides of openings smaller than the joist spacing.

(4) Provide anchored end blocking where joist ends are not restrained against rotation.

COLD-FORMED METAL WALL FRAMING:

(1) All light gage metal framing studs for walls shall be "S" series as indicated on structural drawings. Studs on exterior walls shall have a minimum protective coating equal to G-60 galvanized finish.

(2) All light gage metal framing accessories for load bearing wall constructions have a minimum yield strength of 40 ksi with all accessories in exterior walls having a minimum protective coating equal to G-60 galvanized finish.

(3) Studs shall be anchored to continuous track at top and bottom per manufacturer's recommendations except as noted otherwise.

(4) Bracing of wall studs shall be accomplished by either cold rolled channel run horizontally through the stud punchouts and attached at each stud, or, by a minimum of 2" wide steel straps (same gage as the wall studs) run horizontally at both sides of the studs at continuous sheathing joints attached to each stud. Vertical spacing of the bracing is limited to a maximum of 4'-0" throughout the height of the wall.

(5) Wall studs shall not be spliced or have cutouts in the flanges.

VERTICAL COLD-FORMED METAL STUD SHEARWALLS (Skylight Support):

(1) All exterior stud surrounding the skylight are to be as indicated on the structural drawings. They are to provide permanent lateral support of the skylight structure. These walls indicated as shearwalls are to consist of wall sheathing and light gage stud framing with special fastening as indicated in the Exterior Sheathing Note in this section.

(2) EXTERIOR SHEARWALL SHEATHING – All walls indicated as shearwalls shall be sheathed with minimum of 7/16" (1/2" nominal) Exposure I rated plywood or OSB sheathing (applied perpendicular to framing) one side of wall with a 24/16 APA Span Rating conforming to DOC PS 1, DOC PS 2. All panels shall be identified with a grade mark of certificate of inspection issued by an APA approved agency. Exterior shearwall shall be blocked diaphragm with edges of all panels supported by wall studs or minimum 2x4 blocking. Sheathing shall be fastened with #10 countersunk tapping screws with a minimum head diameter of 0.333 inches conforming to ASTM C1513) at 6" o.c at panel edges to studs & blocking and at 12" o.c. at intermediate wall stud framing members. Screws are to be located not less than 3/8" from edges of panels & framing.

(3) All light gage metal walls indicated on the plans as shearwalls shall be constructed as shown on the drawings and details and as noted in the General Structural Notes.

(4) All light gage metal framing studs for shearwalls shall be "S" series as indicated on the structural drawings. However, under no circumstances shall the shearwall framing provided be less than a minimum of 3 1/2" deep with 1 5/8" wide flanges with a 3/8" return lip with tracks a minimum of 3 1/2" deep with 1 1/4" wide flanges. Both studs and tracks shall have a minimum uncoated base metal thickness of 0.033 inches and shall be ASTM A446 Grade A or ASTM A653, SQ, Grade 33.

(5) Shearwall studs on exterior walls shall have a minimum protective coating equal to G-60 galvanized finish.

(6) Shearwall stud framing shall be anchored to adjacent studs, tracks, or posts with a minimum of #10 wafer head self-drilling framing screws.

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REGISTERED PROFESSIONAL ENGINEER
KODY SCHAROSCH
PE 10770
DATE 11-4-21
NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
CW PROJECT# C2139A
SHEET S801
GENERAL STRUCTURAL NOTES

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REQUIRED SPECIAL INSPECTIONS OF STRUCTURAL STEEL

	Frequency		
	Continuous	Periodic	Comments:
OTHER THAN STRUCTURAL STEEL (IBC 1705.11.3)			
Steel Roof & Floor Deck: (SDI -QA/QC)			
Material verification of steel deck		♦	Identification markings per applicable ASTM standard.
Roof and Floor deck welds		♦	Verify that welds conform to AWS D1.3.
Installation of mechanical fasteners		♦	Verify that fasteners conform to SDI C, SDI NC, SDI RD & manufacturer's instruction as well as construction documents
STRUCTURAL STEEL CONSTRUCTION (IBC 1705.2, 1705.11, 1705.12)			
Prior to Welding (Table N5.4-1, AISC 360-16):			
Verify welding procedures	♦		
Material identification		♦	Verify type and grade of material.
Welder identification		♦	Verify there is a system in place to identify the welder who has welded a joint or member.
Fit-up groove welds		♦	Verify joint preparation, dimensions, cleanliness, tacking and backing.
Access holes		♦	Verify configuration and finish.
Fit-up fillet welds		♦	Verify alignment, gaps at root, cleanliness of steel surfaces, tack weld quality and location.
During Welding (Table N5.4-02, AISC 360-16):			
Use of qualified inspectors		♦	Verify that welders are appropriately qualified.
Control and handling of welding consumables		♦	Verify packaging and exposure control.
Cracked tack welds		♦	Verify welding is not over a cracked tack weld.
Environmental conditions		♦	Verify wind speed is within limits as well as precipitation and temperature.
WPS followed		♦	Verify items such as welding equipment settings, travel speed, welding materials, shielding gas type/flow rate, preheat applied, interpass temperature maintained, and proper position.
Welding techniques		♦	Verify interpass and final cleaning, each pass is within profile limitations, and quality of each pass.
Steel headed studs anchors atop beams	♦		Verify placement and installation of steel headed stud anchors. See general structural notes for additional commentary of the testing of headed stud anchors
After Welding (Table N5.4-3, AISC 360-16):			
Welds cleaned		♦	Verify that welds have been properly cleaned.
Size, length and location of welds	♦		
Welds meet visual acceptance criteria	♦		
Arc strikes	♦		
k-area	♦		
Backing & welding tabs removed	♦		
Repair activities	♦		
Document acceptance/rejection of weld	♦		
No prohibited welds have been added without the approval of the EOR		♦	
Nondestructive Testing (N5.5, AISC 360-16):			
CJP welds	♦		Ultrasonic testing shall be performed on 100% of CJP groove welds subjected to transversely applied tension loading in butt, T-and corner joints, in materials 5/16-inch thick or greater. Testing rate must be increased if > 5% of welds have unacceptable defects.
Access holes (Flange > 2")	♦		
Welded Joints subject to fatigue	♦		
Other Steel Inspections (Table N5.7, AISC 360-16; Tables J8-1 and J10-1, AISC 341-10):			
Structural steel details		♦	All fabricated steel and their connections shall be inspected to verify compliance with the details shown in the approved plans.
Anchor rods/embeds supporting structural steel		♦	Shall be on the premises during the placement of anchor rods/embedments. Verify diameter, grade, type, and length of element and the extent or depth of embedment prior to placement of concrete.
Reduced beam sections (RBS)		♦	Verify contour and finish as well as dimensional tolerances (see Table J8-1 of AISC 341).
Protected Zones		♦	Verify that no holes or unapproved attachments are made within the protected zone (see Table J8-1 of AISC 341)

REQUIRED SPECIAL INSPECTIONS OF CONCRETE CONSTRUCTION (IBC Table 1705.3)

	Frequency		
	Continuous	Periodic	Comments:
1) Inspect Reinforcement			
Inspect reinforcement and verify placement.		♦	Verify reinforcing and placement as shown on drawings and per ACI 318 Ch. 20, 25.2, 25.3, 26.6.1-26.6.3 & IBC 1908.4
2) Reinforcing Bar Welding:			
Verify weldability of reinforcing bars other than ASTM A706:		♦	Verify bar welding per AWS D1.4 & ACI 318: 26.6.4
Inspect single-pass fillet welds, maximum 5/16"; and		♦	
Inspect all other welds.	♦		
3) Inspect anchors cast in concrete.		♦	Verify anchors are cast in concrete per structural drawings and ACI 318: 17.8.2
4) Inspect anchors post-installed in hardened concrete members [b]:			
Adhesive anchors installed in horizontally or upwardly inclined orientations to resist sustained tension loads.	♦		Verify anchors are post installed in concrete per structural drawings, ACI 318: 17.8.2.4 (adhesive anchors) & 17.8.2 (mechanical anchors)
Mechanical anchors and adhesive anchors not defined in 4.a.		♦	
5) Verify use of required design mix.		♦	Verify mix designs meet strength and exposure requirements listed on approved plans; verify compliance with ACI 318: Ch. 19, 26.4.3, 26.4.4, & IBC 1904.1, 1904.2, 1908.2, 1908.3
6) Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	♦		Verify, perform, & examine tests per ASTM C172, ASTM C31, ACI 318: 26.4 & 26.12, and IBC 1908.10
7) Inspect concrete placement & application techniques.	♦		Inspect concrete & shotcrete placement for proper application per ACI 318: 26.5 & IBC 1908.6, 1908.7, & 1908.8
8) Verify curing temperature and techniques.		♦	Verify concrete curing temperature and technique is being maintained per approved plans, ACI 318: 26.5.3-26.5.5, & IBC 1908.9
9) Verify in-situ concrete strength, prior to removal of shores and forms from beams and structural slabs.		♦	Verify strength per ACI 318: 26.11.2
10) Inspect formwork for shape, location and dimensions of the concrete member being formed.		♦	Inspect formwork for shape, locations, and dimensions of concrete member being formed per approved drawings and ACI 318: 26.11.1.2(b)

For SI: 1 inch = 25.4 mm.
(a) Where applicable, see also Section 1705.12, Special inspections for seismic resistance.
(b) Specific requirements for special inspection shall be included in the research report for the anchor issued by an approved source in accordance with i7.8.2 in ACI 318, or other qualification procedures. Where specific requirements are not provided, special inspection requirements shall be specified by the registered design professional and shall be approved by the building official prior to the commencement of the work.

REQUIRED SPECIAL INSPECTION OF MASONRY (LEVEL B QUALITY ASSURANCE) (IBC 1705.4 & Table 3.1.2 of TMS-402/ACI 530-13)

	Frequency		
	Continuous	Periodic	Comments:
1) Minimum Testing:			
Verification of Slump flow & Visual Stability Index (VSI) as delivered to the project site in accordance with Specification Article 1.5 B.1.b.3 for self-consolidating grout		♦	Compressive strength tests per ASTM C1019 for slump flow and ASTM C 1611 for VSI.
Verification of f'_m and f'_{AAC} in accordance with Specification Article 1.4 B prior to construction, except where specifically exempted by this Code		♦	Determine compressive strength per "unit strength" or "prism test" of ACI 530 prior to construction.
2) Prior to Construction:			
Verify compliance with the approved submittals		♦	Verify materials conform to approved construction documents. Mix designs, test results, material certificates, and construction procedures should be submitted for review. Mortar mix designs shall conform to ASTM C 270 while grout shall conform to ASTM C 476. Material certificates shall be provided for the following: reinforcement, anchors, ties, fasteners, and metal accessories; masonry units; mortar and grout materials. Review cold-weather or hot-weather construction procedures. Refer to Article 1.5 of ACI 530.1.
3) As Construction Begins:			
Proportions of site-prepared mortar		♦	Verify that mortar is type and color specified on approved plans, it conforms to ASTM C 270, and is mixed per Article 2.6A of ACI 530.1
Construction of mortar joints		♦	Verify mortar joints meet Article 3.3B of ACI 530.1.
Grade and size of reinforcing and anchorages		♦	Verify prestressed reinforcement meets Article 2.4B of ACI 530.1
Location of reinforcement, connectors, and anchorages		♦	Verify reinforcement is placed in accordance with Article 3.4 B, 3.6A of ACI 530.1
Properties of thin-bed mortar for AAC masonry	♦[b]	♦[c]	Verify thin-bed mortar complies to Article 2.1C of ACI 530.1
4) Prior to Grouting:			
Grout space		♦	Verify grout space is free of mortar droppings, debris, loose aggregate, and other deleterious materials and that cleanouts are provided per Article 3.2D and 3.2F of ACI 530.1
Grade, type, and size of reinforcement and anchor bolts, and prestressing tendons and anchorages		♦	Verify reinforcement, joint reinforcement, anchor bolts and veneer anchors comply with approved plans and Section 6.1 of ACI 530
Placement of reinforcement, connectors, and prestressing tendon and anchorages		♦	Verify reinforcement, joint reinforcement, anchor bolts and veneer anchors comply with approved plans and Article 3.2E, 3.4, & 3.6A of ACI 530.1
Proportions of site-prepared grout and prestressing grout for bonded tendons		♦	Verify grout proportions meet ASTM C 476 and slump is as called out on General Structural Notes or specifications.
Construction of mortar joints		♦	Verify mortar joints placed in accordance with Article 3.3B of ACI 530.1.
5) During Construction:			
Size and location of structural elements		♦	Verify locations of structural elements per approved plans and confirm tolerances meet Article 3.3F of ACI 530.1
Type, size, and location of anchors, including other details of anchorage of masonry to structural members, frames, or other construction		♦	Verify correct anchorages and connections are provided per approved plans and Sections 1.2.1(e), 6.1.4.3, & 6.2.1 of ACI 530
Welding of reinforcement	♦		Verify welding reinforcement complies to Section 8.1.6.7.2, 9.3.3.4 (c), & 11.3.3.4(b) of ACI 530.
Preparation, construction, and protection of masonry during cold weather (temperature below 40°F (44°C)) or hot weather (temperature above 90°F (32.2°C))		♦	Verify cold-weather construction complies with Article 1.8C and hot-weather construction complies with Article 1.8D of ACI 530.1.
Application and measurement of prestressing force	♦		Verify measuring of force is per Article 3.6B of ACI 530.1
Placement of AAC masonry units and construction of thin-bed mortar joints	♦[b]	♦[c]	Verify placement of units and construction is per Article 3.3 B.9, and 3.3F.1.b of ACI 530.1
Observe preparation of grout specimens, mortar specimens, and/or prisms		♦	Confirm specimens/prisms are performed as required by Article 1.4 of ACI 530.1

(a) Frequency refers to the frequency of Special Inspection, which may be continuous during the task listed or periodic during the listed task, as defined in the table.
(b) Required for the first 5000 square feet (465 square meters) of AAC masonry.
(c) Required after the first 5000 square feet (465 square meters) of AAC masonry.

REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS (IBC 2018 Section 1705.6 & Table 1705.6)

	Frequency		
	Continuous	Periodic	Comments:
1) Minimum Testing:			
Verify Materials below shallow foundations are adequate to achieve the design bearing capacity.		♦	
2) Prior to Construction:			
Verify excavations are extended to proper depth and have reached proper material.		♦	
3) As Construction Begins:			
Perform classification and testing of compacted fill material.		♦	
		♦	
4) During Construction:			
Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.	♦		
Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly.		♦	

REQUIRED SPECIAL INSPECTIONS AND TESTS OF DRIVEN DEEP FOUNDATIONS (IBC 2018 Section 1705.7 & Table 1705.7)

	Frequency		
	Continuous	Periodic	Comments:
1) Prior to Construction:			
Verify element materials, sizes, and lengths supplied comply with the project requirements.	♦	-	
2) During Construction:			
Verify element materials, sizes, and lengths installed comply with the project requirements.	♦	-	All installation requirements to be documents and submitted per the project specifications
Determine capacities of test elements and conduct additional load tests, as required	♦	-	Submit all load testing per project specifications
Inspect installation/driving operations and maintain complete accurate records for each element	♦	-	
Verify placement locations and plumbness, determine required penetration to achieve design capacity, record tip and butt elevations and document any damage to foundation element.	♦	-	
ADDITIONAL ELEMENTS:			
For steel elements, perform additional special inspections in accordance with Section 1705.2	-	-	Refer to section 1705.2 of the IBC
For concrete elements and concrete-filled elements, perform tests and additional special inspections in accordance with Section 1705.3	-	-	Refer to section 1705.3 of the IBC
For specialty elements, perform additional inspections as determined by the registered design professional in responsible charge.	-	-	Refer to any additional required in the construction documents for additional specialty element inspections.

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REGISTERED PROFESSIONAL ENGINEER
KODY SCHAROSCH
PE 10770
DATE 11-4-21
NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE
11/04/21
PHASE
CONSTRUCTION DOCUMENTS
CW PROJECT#
C2139A
SHEET
S802
SPECIAL INSP. TABLES

CW STRUCTURAL ENGINEERS
1000 E. CALGARY AVE, SUITE 2
BISMARCK, ND 58503
701.221.3286 - WWW.CWSTRUCTURAL.NET

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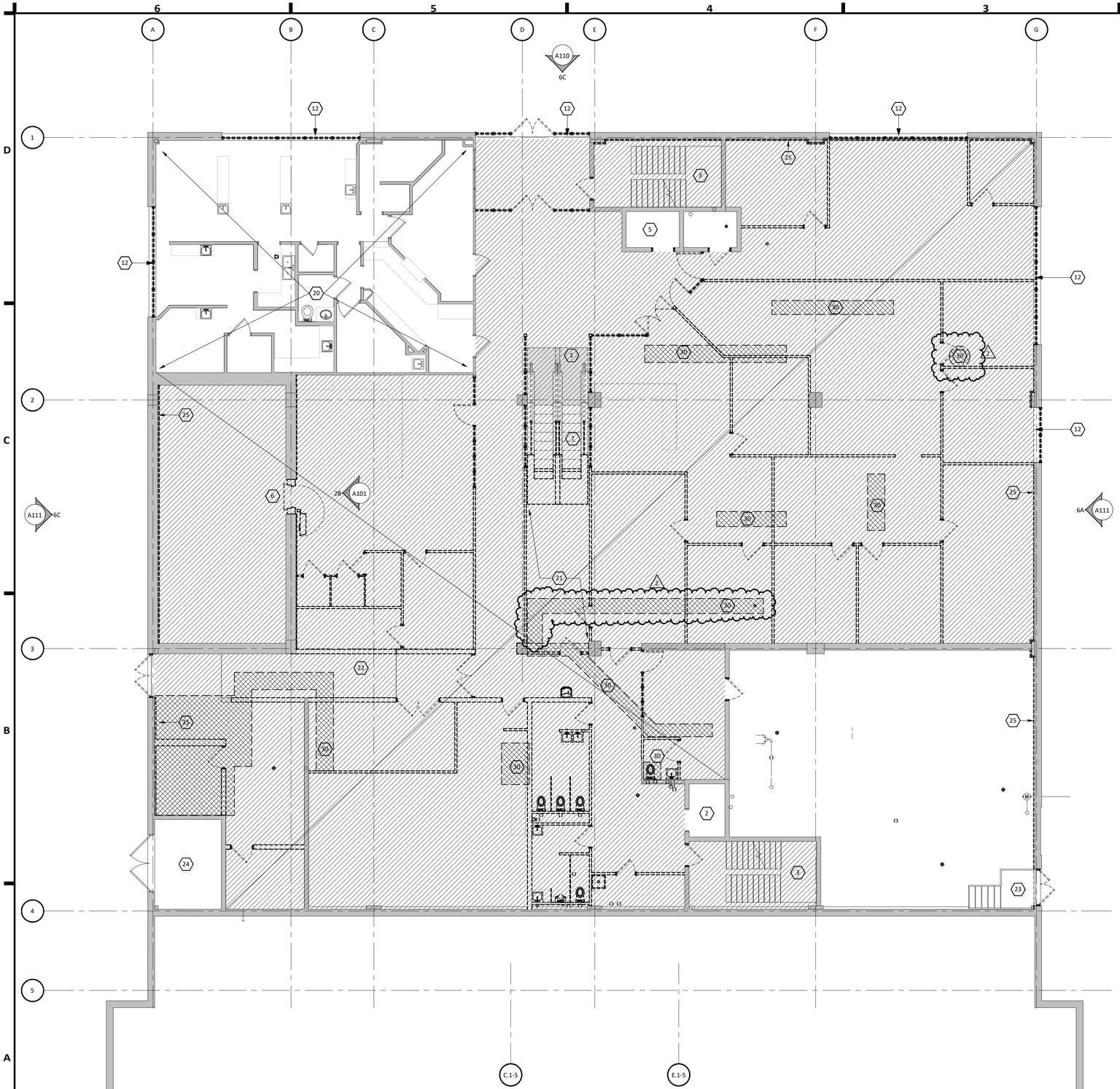
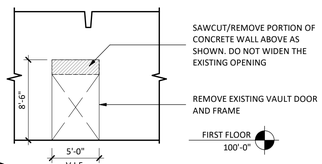


6A / A101 FIRST FLOOR DEMOLITION PLAN
SCALE: 1/8" = 1'-0"

DEMOLITION KEYNOTES

KEYNOTE	DESCRIPTION
1	REMOVE PORTION OF ESCALTOR PIT AS REQUIRED FOR NEW ELEVATOR PIT - SEE VERTICAL CIRCULATION AND STRUCTURAL DRAWINGS
2	EXISTING ELEVATOR TO REMAIN.
3	EXISTING STAIRWELL; REMOVE EXISTING FLOORING AT TREADS, RISERS, AND LANDINGS. PREP FOR NEW FLOORING. SEE FINISH PLANS FOR MORE INFORMATION. EXISTING RAILINGS ARE TO REMAIN
4	ALTERNATE BID - REMOVE PRECAST PANELS & PREP EXISTING CONCRETE STRUCTURE FOR NEW CURTAINWALL INSTALLATION - SEE ALTERNATE PLANS & ELEVATIONS
5	EXISTING ELEVATOR CAB AND ALL ASSOCIATED EQUIPMENT IS TO BE REMOVED. HOISTWAY TO BE USED FOR NEW MECHANICAL CHASE. SEE MEP DRAWINGS FOR MORE INFORMATION. INFILL DOOR OPENINGS, SEE FLOOR PLANS.
6	EXISTING VAULT DOOR FRAME AND DAY GATE TO BE REMOVED - OPENING HEIGHT TO BE ENLARGED. SEE FLOOR PLANS.
7	REMOVE EXISTING ESCALTOR ENTIRELY, PREP AREA FOR NEW STAIR AND ELEVATOR. SEE FLOOR PLANS.
8	REMOVE EXISTING VAULT DOOR AND FRAME, PREP OPENING FOR NEW DOOR - SEE FLOOR PLAN.
9	CUT NEW OPENING IN EXISTING CONCRETE FLOOR STRUCTURE. SEE STRUCTURAL FOR MORE INFORMATION. EXACT DIMENSIONS ARE TO BE VERIFIED IN THE FIELD BASED ON EXISTING STRUCTURE
10	CUT NEW OPENING IN EXISTING CONCRETE ROOF STRUCTURE. SEE STRUCTURAL FOR MORE INFORMATION. EXACT DIMENSIONS ARE TO BE VERIFIED IN THE FIELD BASED ON EXISTING STRUCTURE
11	BID ALTERNATE 12 - REMOVE AND SALVAGE EXISTING STONE BALLAST, REMOVE AND DISCARD EXISTING ROOF MEMBRANE, EXISTING INSULATION TO REMAIN. PREP FOR NEW ROOFING. SEE ROOF PLAN.
12	ALTERNATE BID 2 - REMOVE EXISTING ALUMINUM CURTAINWALL OR STOREFRONT GLAZING SYSTEM. PREP OPENING FOR NEW STOREFRONT OR CURTAINWALL - SEE FLOOR PLANS.
13	ALTERNATE BID 3 - REMOVE EXISTING PRECAST CONCRETE COLUMN WRAP
14	ALTERNATE BID 3 - REMOVE EXISTING PRECAST CONCRETE CANOPY FASCIA
15	BID ALTERNATE 12 - REMOVE EXISTING PARAPET FASTENED TERMINATION BAR. PREPARE FOR NEW MEMBRANE. SEE ROOF PLAN
16	EXISTING ROOF HATCH TO REMAIN
17	REMOVE EXISTING LIGHTING AND PATCH PRECAST PANEL TO MATCH
19	REMOVE EXISTING DOOR AND FRAME IN ITS ENTIRETY
20	EXISTING TENANT SPACE TO REMAIN OPERATIONAL DURING CONSTRUCTION. SELECTIVE DEMOLITION AS REQUIRED FOR INSTALALTION OF SPRINKLER SYSTEM AND WINDOW REPLACEMENT (ALTERNATE BID)
21	EXISTING CONCRETE SLAB ON GRADE FLOOR TO BE SAW CUT AND REMOVED AS REQUIRED FOR INSTALLATION OF NEW UNDERSLAB PLUMBING AND ELECTRICAL. AREAS SHOWN ARE FOR REFERENCE ONLY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM EXACT SLAB CUTTING REQUIRED TO ACCOMODATE NEW CONSTRUCTION. SEE MEP DRAWINGS FOR MORE INFORMATION. SEE STRUCTURAL DRAWINGS FOR SLAB IN-FILL DETAIL.
22	EXISTING CONCRETE RAMP TO BE REMOVED. SEE STRUCTURAL DRAWINGS FOR MORE INFORMATION.
23	EXISTING STAIR TO REMAIN
24	EXISTING TRANFORMER ROOM TO REMAIN - SEE ELECTRICAL FOR MORE INFORMATION
25	ALTERNATE BID: EXISTING 1ST FLOOR PERIMETER WALL INSULATION AND GYPSUM BOARD TO BE REMOVED. PREP CONCRETE WALL FOR NEW INSULATION AND FURRING. SEE FLOOR PLAN AND TYPICAL ASSEMBLIES FOR MORE INFORMATION. EXTENTS OF PERIMETER INSULATION/WALL REPLACEMENT DO NOT INCLUDE CURRENT DENTIST OFFICE (NW CORNER). BASE BID: EXISTING PERIMETER WALL INSULATION AND GYPSUM BOARD TO REMAIN.
26	ALTERNATE BID: EXISTING 2ND/3RD FLOOR PERIMETER GYPSUM BOARD, METAL STUD FRAMING, AND BATT INSULATION TO BE REMOVED. PREP BACKSIDE OF EXISTING PRECAST PANELS FOR NEW INSULATION AND FURRING. SEE FLOOR PLAN AND TYPICAL ASSEMBLIES FOR MORE INFORMATION. BASE BID: EXISTING 2ND/3RD FLOOR PERIMETER GYPSUM BOARD, METAL STUD FRAMING, AND BATT INSULATION TO REMAIN.
27	EXISTING COOLING TOWER, TO BE RELOCATED. SEE MEP DRAWINGS FOR MORE INFORMATION. PATCH EXISTING ROOF AS REQUIRED.
28	APPROXIMATE LOCATION OF RELOCATED COOLING TOWER. TIE CURB INTO EXISTING ROOFING. SEE MEP AND STRUCTURAL DRAWINGS FOR MORE INFORMATION.
29	APPROXIMATE LOCATION OF NEW ROOFTUP MECHANICAL UNIT. TIE CURB INTO EXISTING ROOFING.
30	APPROXIMATE EXTENTS OF FLOOR SLAB DEMO REQ'D FOR NEW PLUMBING &/OR ELECTRICAL - SEE MECH & ELEC DWG'S



2B / A101 VAULT DOOR - DEMO
SCALE: 1/8" = 1'-0"

DEMOLITION GENERAL NOTES

A. THE OWNER'S NORMAL OPERATIONS WILL BE CONTINUED DURING DEMOLITION. DEMOLITION CONTRACTOR SHALL NOT INTERFERE WITH THESE OPERATIONS IN ANY WAY WITHOUT THE OWNER'S EXPRESSED CONSENT.
B. OWNER WILL OCCUPY PORTIONS OF THE BUILDING IMMEDIATELY ADJACENT TO AREAS OF SELECTIVE DEMOLITION. CONDUCT SELECTIVE DEMOLITION WORK IN MANNER THAT WILL MINIMIZE NEED FOR DISRUPTION OF OWNER'S NORMAL OPERATIONS. REFER TO SPECIFICATIONS FOR MINIMUM ADVANCE NOTICE TO OWNER.
C. PROVIDE TEMPORARY BARRICADES AND OTHER FORMS OF PROTECTION TO PROTECT OWNER'S PERSONNEL AND GENERAL PUBLIC FROM INJURY DUE TO SELECTIVE DEMOLITION WORK.
D. PROVIDE 1 - HOUR FIRE RESISTANT CONSTRUCTION BARRIERS WHERE REQ'D TO PROTECT EXISTING CONSTRUCTION AND OWNERS OPERATIONS.
E. PROTECT FROM DAMAGE EXISTING FINISH WORK THAT IS TO REMAIN IN PLACE AND BECOME EXPOSED DURING DEMOLITION OPERATIONS.
F. PROTECT FLOORS WITH SUITABLE COVERING WHEN NECESSARY.
G. COVER AND PROTECT FURNITURE, EQUIPMENT, AND FIXTURES FROM SOILAGE OR DAMAGE WHEN DEMOLITION WORK IS PERFORMED IN AREAS WHERE SUCH ITEMS HAVE NOT BEEN REMOVED.
H. PRIOR TO CUTTING EXISTING CONSTRUCTION, LOCATE AND IDENTIFY SERVICES TO REMAIN IN OPERATION, INCLUDING ALL FLOOR PENETRATIONS. UNDOCUMENTED CONDITIONS, UTILITY RISERS, ETC. AND ANY WALLS THAT CONTAIN LIFE SAFETY VERTICAL RISERS THAT MUST REMAIN IN OPERATION DURING THE DEMOLITION WORK.
I. CONTRACTOR SHALL VERIFY ALL EXISTING BUILDING DIMENSIONS, PARTITION AND WALL LOCATIONS AND FLOOR ELEVATIONS IN FIELD AND NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES BEFORE THE START OF WORK.
J. WHEN UNANTICIPATED MECHANICAL, ELECTRICAL, OR STRUCTURAL ELEMENTS THAT CONFLICT WITH INTENDED FUNCTION OF DESIGN ARE ENCOUNTERED,INVESTIGATE AND MEASURE BOTH NATURE AND EXTENT OF THE CONFLICT AND NOTIFY OWNER'S REPRESENTATIVE.
K. MAINTAIN EXISTING UTILITIES INDICATED TO REMAIN IN SERVICE AND PROTECT THEM AGAINST DAMAGE DURING DEMOLITION OPERATIONS. DO NOT INTERRUPT UTILITIES SERVING OCCUPIED OR USED FACILITIES, EXCEPT WHEN AUTHORIZED IN WRITING BY AUTHORITIES HAVING JURISDICTION.
L. WHERE DEMOLITION IS REQ'D BEYOND THE LIMITS OF THE CONTRACT TO ROUTE NEW DUCTWORK, PIPING, CONDUITS ETC., RATED WALLS AND SMOKE BARRIERS SHALL BE PATCHED BY CONTRACTOR REQUIRING PENETRATIONS, ALL FINISHES DAMAGED BY THE WORK SHALL BE RESTORED TO THEIR ORIGINAL CONDITION.
M. REPAIR DEMOLITION PERFORMED IN EXCESS OF THAT REQ'D. RETURN ELEMENTS OF CONSTRUCTION AND SURFACES TO REMAIN, TO THE CONDITION EXISTING PRIOR TO START OF OPERATIONS. REPAIR ADJACENT CONSTRUCTION OR SURFACES SOILED OR DAMAGED BY SELECTIVE DEMOLITION.
N. PROVIDE SHORING, BRACING AND ANY OTHER MEANS REQ'D TO PROTECT AND MAINTAIN THE SAFETY, INTEGRITY AND STABILITY OF ALL EXISTING AND NEW CONSTRUCTION.
O. WHEN ROOFING, GLAZING, FLASHING, COPING OR PORTIONS OF EXTERIOR WALLS ARE REMOVED OR OPENED, SUITABLE WEATHER PROTECTION SHALL BE PROVIDED AND MAINTAINED FOR THE DURATION OF WORK.
P. REMOVAL OF ITEMS NOTED INCLUDES REMOVAL OF ANCHORS, ADHESIVES, HARDWARE, CONDUIT, WIRE, PIPING, ETC. FOR A COMPLETE REMOVAL OF THE ITEMS OR SYSTEMS.
Q. WHEREVER WATER CLOSETS, FLOOR SINKS OR OTHER EQUIPMENT AND RELATED PIPING ARE TO BE REMOVED, PATCH FLOOR SLAB W/ CONCRETE AS REQUIRED.
R. ALL CONCRETE FLOOR SLABS NOTED TO BE REMOVED SHALL BE SAWCUT TO PROVIDE A NEAT JOINT.
S. SEE MECHANICAL, CIVIL, AND ELECTRICAL DEMOLITION DRAWINGS FOR ADDITIONAL SCOPE OF DEMOLITION WORK.
T. DEMOLITION OF ANY EXISTING CONSTRUCTION SHALL INCLUDE WHAT IS NECESSARY AND REQ'D TO ACCOMMODATE THE REQUIREMENTS OF NEW CONSTRUCTION. REFER TO THE APPROPRIATE DRAWINGS AS TO THE EXTENT OF NEW CONSTRUCTION TO REMAIN.
U. SURFACES SHALL BE CLEANED AND PREPPED WITHIN THE NEW MATERIALS GUIDELINES OF INSTALLATION OF THEIR PRODUCT IN EXISTING CONSTRUCTION.
V. ALL DEMOLITION SHALL COMPLY WITH APPLICABLE LOCAL CODES AND STATE CODES AND ORDINANCES.
W. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS

DEMOLITION LEGEND

- EXISTING WALL/OBJECT TO REMAIN
- EXISTING WALL/OBJECT TO BE REMOVED
- EXISTING DOOR, FRAME, AND TRIM TO REMAIN
- EXISTING DOOR, FRAME, AND TRIM TO BE REMOVED

FOR ENTIRE SHADED AREA:
-COMPLETELY REMOVE DASHED WALLS (DEMO WALLS)
-COMPLETELY REMOVE DOORS, FRAMES, AND TRIM, U.N.O.
-COMPLETELY REMOVE ALL EXISTING FLOOR FINISHES.
-COMPLETELY REMOVE CEILINGS AND CLG MTD ITEMS, U.N.O.
-REMOVE ALL EXISTING CASEWORK
-REMOVE ALL EXISTING FLOOR AND WALL MTD ITEMS AND TRIM.
-REMOVE ALL PLUMBING FIXTURES & ASSOCIATED ITEMS.
-SEE M.E.P. & STRUCT. DRAWINGS FOR MORE INFORMATION.

XX - DEMOLITION KEYNOTE

ALL DEMOLITION WORK REQUIRED IS NOT NECESSARILY LIMITED TO WHAT IS SHOWN ON THE DEMOLITION PLANS. THE INTENT IS TO REMOVE ALL MECHANICAL, ELECTRICAL AND ARCHITECTURAL ITEMS AS REQUIRED TO FACILITATE NEW CONSTRUCTION.

REFER TO FINISH SCHEDULE FOR ADDITIONAL FINISH WORK REQUIRED IN OTHER AREAS THAT ARE NOT DOCUMENTED TO RECEIVE AND DEMOLITION/REMOVAL WORK INDICATED ON DEMOLITION PLANS (TYPICAL).

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
7366
11/18/2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE
2	ADDENDUM 2	11/18/21

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE
11/04/21
PHASE
CONSTRUCTION DOCUMENTS
PROJECT
21019
SHEET
A101
FIRST FLOOR DEMOLITION PLAN

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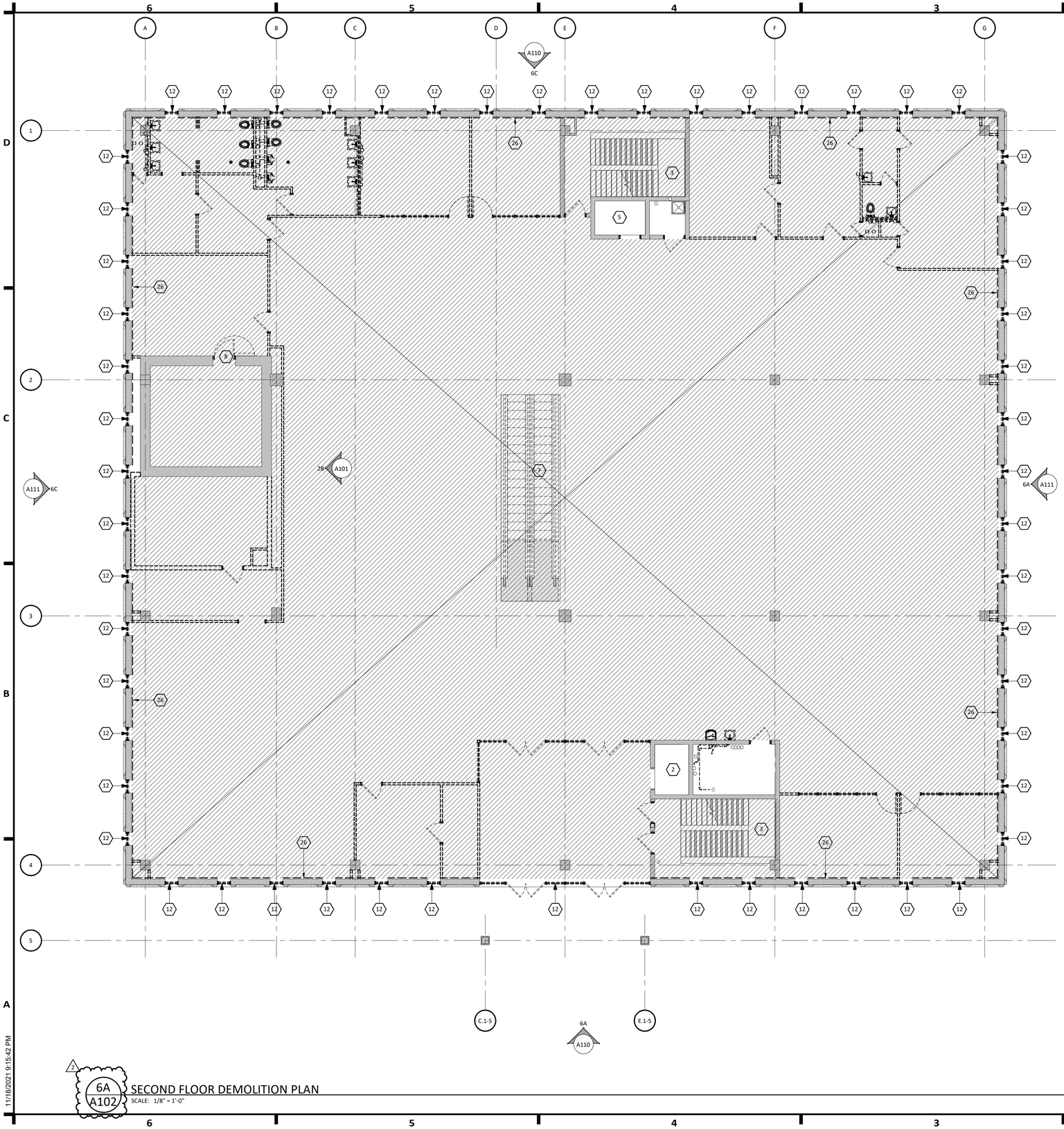

2 6A A102 SECOND FLOOR DEMOLITION PLAN
SCALE: 1/8" = 1'-0"

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DEMOLITION KEYNOTES

XX KEYNOTE	DESCRIPTION
1	REMOVE PORTION OF ESCALTOR PIT AS REQUIRED FOR NEW ELEVATOR PIT - SEE VERTICAL CIRCULATION AND STRUCTURAL DRAWINGS
2	EXISTING ELEVATOR TO REMAIN.
3	EXISTING STAIRWELL; REMOVE EXISTING FLOORING AT TREADS, RISERS, AND LANDINGS. PREP FOR NEW FLOORING. SEE FINISH PLANS FOR MORE INFORMATION. EXISTING RAILINGS ARE TO REMAIN
4	ALTERNATE BID - REMOVE PRECAST PANELS & PREP EXISTING CONCRETE STRUCTURE FOR NEW CURTAINWALL INSTALLATION - SEE ALTERNATE PLANS & ELEVATIONS
5	EXISTING ELEVATOR CAB AND ALL ASSOCIATED EQUIPMENT IS TO BE REMOVED. HOISTWAY TO BE USED FOR NEW MECHANICAL CHASE. SEE MEP DRAWINGS FOR MORE INFORMATION. INFILL DOOR OPENINGS, SEE FLOOR PLANS.
6	EXISTING VAULT DOOR FRAME AND DAY GATE TO BE REMOVED - OPENING HEIGHT TO BE ENLARGED. SEE FLOOR PLANS.
7	REMOVE EXISTING ESCALTOR ENTIRELY, PREP AREA FOR NEW STAIR AND ELEVATOR. SEE FLOOR PLANS.
8	REMOVE EXISTING VAULT DOOR AND FRAME, PREP OPENING FOR NEW DOOR - SEE FLOOR PLAN.
9	CUT NEW OPENING IN EXISTING CONCRETE FLOOR STRUCTURE. SEE STRUCTURAL FOR MORE INFORMATION. EXACT DIMENSIONS ARE TO BE VERIFIED IN THE FIELD BASED ON EXISTING STRUCTURE
10	CUT NEW OPENING IN EXISTING CONCRETE ROOF STRUCTURE. SEE STRUCTURAL FOR MORE INFORMATION. EXACT DIMENSIONS ARE TO BE VERIFIED IN THE FIELD BASED ON EXISTING STRUCTURE
11	BID ALTERNATE 12 - REMOVE AND SALVAGE EXISTING STONE BALLAST, REMOVE AND DISCARD EXISTING ROOF MEMBRANE, EXISTING INSULATION TO REMAIN. PREP FOR NEW ROOFING. SEE ROOF PLAN.
12	ALTERNATE BID 2 - REMOVE EXISTING ALUMINUM CURTAINWALL OR STOREFRONT GLAZING SYSTEM. PREP OPENING FOR NEW STOREFRONT OR CURTAINWALL - SEE FLOOR PLANS.
13	ALTERNATE BID 3 - REMOVE EXISTING PRECAST CONCRETE COLUMN WRAP
14	ALTERNATE BID 3 - REMOVE EXISTING PRECAST CONCRETE CANOPY FASCIA
15	BID ALTERNATE 12 - REMOVE EXISTING PARAPET FASTENED TERMINATION BAR. PREPARE FOR NEW MEMBRANE. SEE ROOF PLAN
16	EXISTING ROOF HATCH TO REMAIN
17	REMOVE EXISTING LIGHTING AND PATCH PRECAST PANEL TO MATCH
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22	EXISTING CONCRETE RAMP TO BE REMOVED. SEE STRUCTURAL DRAWINGS FOR MORE INFORMATION.
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24	EXISTING TRANFORMER ROOM TO REMAIN - SEE ELECTRICAL FOR MORE INFORMATION
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27	EXISTING COOLING TOWER, TO BE RELOCATED. SEE MEP DRAWINGS FOR MORE INFORMATION. PATCH EXISTING ROOF AS REQUIRED.
28	APPROXIMATE LOCATION OF RELOCATED COOLING TOWER. TIE CURB INTO EXISTING ROOFING. SEE MEP AND STRUCTURAL DRAWINGS FOR MORE INFORMATION.
29	APPROXIMATE LOCATION OF NEW ROOFTUP MECHANICAL UNIT. TIE CURB INTO EXISTING ROOFING.
30	APPROXIMATE EXTENTS OF FLOOR SLAB DEMO REQ'D FOR NEW PLUMBING &/OR ELECTRICAL - SEE MECH & ELEC DWG'S

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C. PROVIDE TEMPORARY BARRICADES AND OTHER FORMS OF PROTECTION TO PROTECT OWNER'S PERSONNEL AND GENERAL PUBLIC FROM INJURY DUE TO SELECTIVE DEMOLITION WORK.
D. PROVIDE 1 - HOUR FIRE RESISTANT CONSTRUCTION BARRIERS WHERE REQ'D TO PROTECT EXISTING CONSTRUCTION AND OWNERS OPERATIONS.
E. PROTECT FROM DAMAGE EXISTING FINISH WORK THAT IS TO REMAIN IN PLACE AND BECOME EXPOSED DURING DEMOLITION OPERATIONS.
F. PROTECT FLOORS WITH SUITABLE COVERING WHEN NECESSARY.
G. COVER AND PROTECT FURNITURE, EQUIPMENT, AND FIXTURES FROM SOILAGE OR DAMAGE WHEN DEMOLITION WORK IS PERFORMED IN AREAS WHERE SUCH ITEMS HAVE NOT BEEN REMOVED.
H. PRIOR TO CUTTING EXISTING CONSTRUCTION, LOCATE AND IDENTIFY SERVICES TO REMAIN IN OPERATION, INCLUDING ALL FLOOR PENETRATIONS. UNDOCUMENTED CONDITIONS, UTILITY RISERS, ETC. AND ANY WALLS THAT CONTAIN LIFE SAFETY VERTICAL RISERS THAT MUST REMAIN IN OPERATION DURING THE DEMOLITION WORK.
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J. WHEN UNANTICIPATED MECHANICAL, ELECTRICAL, OR STRUCTURAL ELEMENTS THAT CONFLICT WITH INTENDED FUNCTION OF DESIGN ARE ENCOUNTERED,INVESTIGATE AND MEASURE BOTH NATURE AND EXTENT OF THE CONFLICT AND NOTIFY OWNER'S REPRESENTATIVE.
K. MAINTAIN EXISTING UTILITIES INDICATED TO REMAIN IN SERVICE AND PROTECT THEM AGAINST DAMAGE DURING DEMOLITION OPERATIONS. DO NOT INTERRUPT UTILITIES SERVING OCCUPIED OR USED FACILITIES, EXCEPT WHEN AUTHORIZED IN WRITING BY AUTHORITIES HAVING JURISDICTION.
L. WHERE DEMOLITION IS REQ'D BEYOND THE LIMITS OF THE CONTRACT TO ROUTE NEW DUCTWORK, PIPING, CONDUITS ETC., RATED WALLS AND SMOKE BARRIERS SHALL BE PATCHED BY CONTRACTOR REQUIRING PENETRATIONS, ALL FINISHES DAMAGED BY THE WORK SHALL BE RESTORED TO THEIR ORIGINAL CONDITION.
M. REPAIR DEMOLITION PERFORMED IN EXCESS OF THAT REQ'D. RETURN ELEMENTS OF CONSTRUCTION AND SURFACES TO REMAIN, TO THE CONDITION EXISTING PRIOR TO START OF OPERATIONS. REPAIR ADJACENT CONSTRUCTION OR SURFACES SOILED OR DAMAGED BY SELECTIVE DEMOLITION.
N. PROVIDE SHORING, BRACING AND ANY OTHER MEANS REQ'D TO PROTECT AND MAINTAIN THE SAFETY, INTEGRITY AND STABILITY OF ALL EXISTING AND NEW CONSTRUCTION.
O. WHEN ROOFING, GLAZING, FLASHING, COPING OR PORTIONS OF EXTERIOR WALLS ARE REMOVED OR OPENED, SUITABLE WEATHER PROTECTION SHALL BE PROVIDED AND MAINTAINED FOR THE DURATION OF WORK.
P. REMOVAL OF ITEMS NOTED INCLUDES REMOVAL OF ANCHORS, ADHESIVES, HARDWARE, CONDUIT, WIRE, PIPING, ETC. FOR A COMPLETE REMOVAL OF THE ITEMS OR SYSTEMS.
Q. WHEREVER WATER CLOSETS, FLOOR SINKS OR OTHER EQUIPMENT AND RELATED PIPING ARE TO BE REMOVED, PATCH FLOOR SLAB W/ CONCRETE AS REQUIRED.
R. ALL CONCRETE FLOOR SLABS NOTED TO BE REMOVED SHALL BE SAWCUT TO PROVIDE A NEAT JOINT.
S. SEE MECHANICAL, CIVIL, AND ELECTRICAL DEMOLITION DRAWINGS FOR ADDITIONAL SCOPE OF DEMOLITION WORK.
T. DEMOLITION OF ANY EXISTING CONSTRUCTION SHALL INCLUDE WHAT IS NECESSARY AND REQ'D TO ACCOMMODATE THE REQUIREMENTS OF NEW CONSTRUCTION. REFER TO THE APPROPRIATE DRAWINGS AS TO THE EXTENT OF NEW CONSTRUCTION TO REMAIN.
U. SURFACES SHALL BE CLEANED AND PREPPED WITHIN THE NEW MATERIALS GUIDELINES OF INSTALLATION OF THEIR PRODUCT IN EXISTING CONSTRUCTION.
V. ALL DEMOLITION SHALL COMPLY WITH APPLICABLE LOCAL CODES AND STATE CODES AND ORDINANCES.
W. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS

DEMOLITION LEGEND

- EXISTING WALL/OBJECT TO REMAIN
- EXISTING WALL/OBJECT TO BE REMOVED
- EXISTING DOOR, FRAME, AND TRIM TO REMAIN
- EXISTING DOOR, FRAME, AND TRIM TO BE REMOVED

FOR ENTIRE SHADED AREA:
-COMPLETELY REMOVE DASHED WALLS (DEMO WALLS)
-COMPLETELY REMOVE DOORS, FRAMES, AND TRIM, U.N.O.
-COMPLETELY REMOVE ALL EXISTING FLOOR FINISHES.
-COMPLETELY REMOVE CEILINGS AND CLG MTD ITEMS, U.N.O.
-REMOVE ALL EXISTING CASEWORK
-REMOVE ALL EXISTING FLOOR AND WALL MTD ITEMS AND TRIM.
-REMOVE ALL PLUMBING FIXTURES & ASSOCIATED ITEMS.
-SEE M.E.P. & STRUCT. DRAWINGS FOR MORE INFORMATION.

XX - DEMOLITION KEYNOTE

ALL DEMOLITION WORK REQUIRED IS NOT NECESSARILY LIMITED TO WHAT IS SHOWN ON THE DEMOLITION PLANS. THE INTENT IS TO REMOVE ALL MECHANICAL, ELECTRICAL AND ARCHITECTURAL ITEMS AS REQUIRED TO FACILITATE NEW CONSTRUCTION.

REFER TO FINISH SCHEDULE FOR ADDITIONAL FINISH WORK REQUIRED IN OTHER AREAS THAT ARE NOT DOCUMENTED TO RECEIVE AND DEMOLITION/REMOVAL WORK INDICATED ON DEMOLITION PLANS (TYPICAL).

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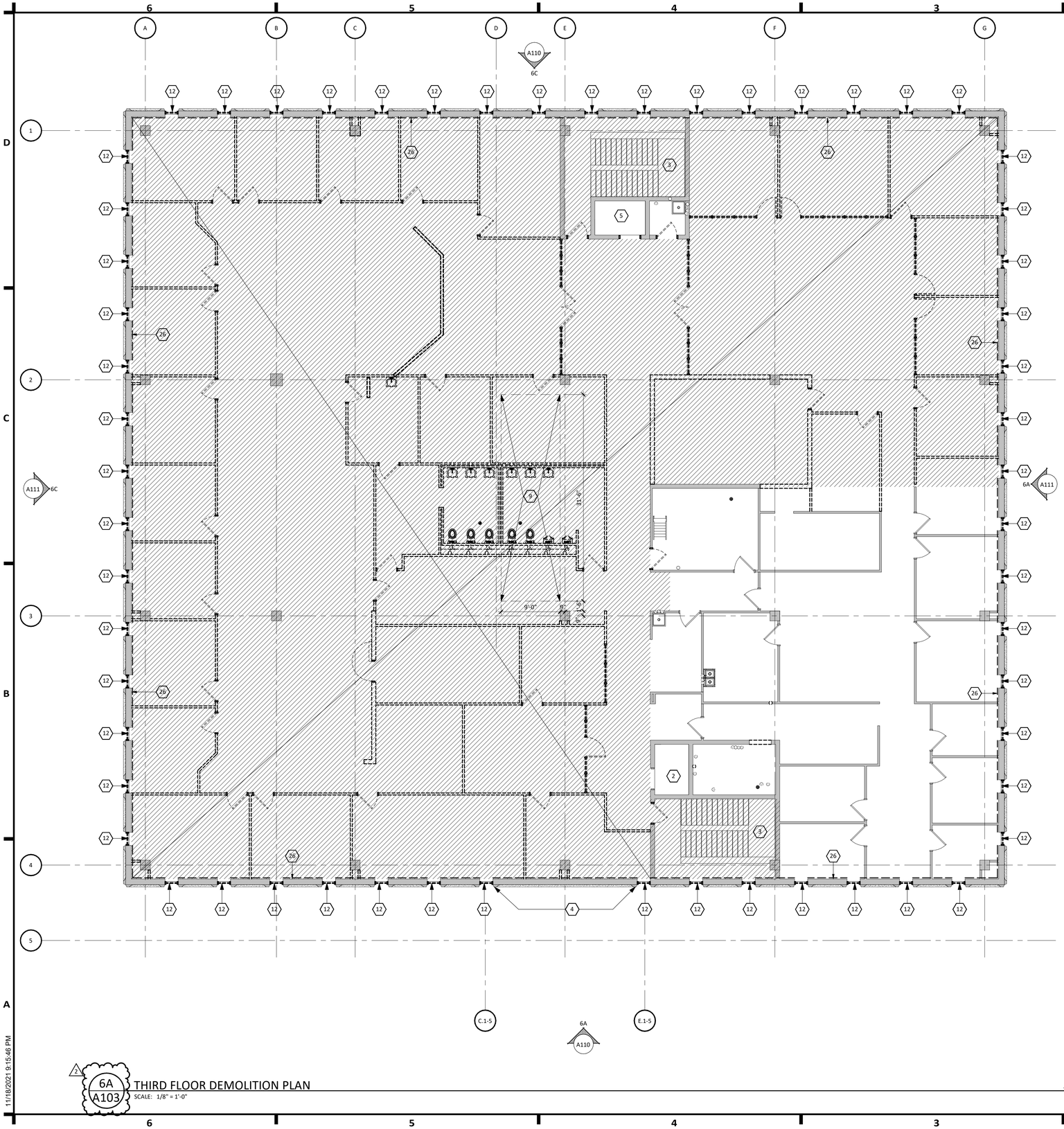
LICENSED ARCHITECT
JENNIFER BURKE JACKSON
7360
11 / 04 / 2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE		
NO.	DESCRIPTION	DATE
2	ADDENDUM 2	11/18/21

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A102
SECOND FLOOR DEMOLITION PLAN



DEMOLITION KEYNOTES

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2	EXISTING ELEVATOR TO REMAIN.
3	EXISTING STAIRWELL; REMOVE EXISTING FLOORING AT TREADS, RISERS, AND LANDINGS. PREP FOR NEW FLOORING. SEE FINISH PLANS FOR MORE INFORMATION. EXISTING RAILINGS ARE TO REMAIN
4	ALTERNATE BID - REMOVE PRECAST PANELS & PREP EXISTING CONCRETE STRUCTURE FOR NEW CURTAINWALL INSTALLATION - SEE ALTERNATE PLANS & ELEVATIONS
5	EXISTING ELEVATOR CAB AND ALL ASSOCIATED EQUIPMENT IS TO BE REMOVED. HOISTWAY TO BE USED FOR NEW MECHANICAL CHASE. SEE MEP DRAWINGS FOR MORE INFORMATION. INFILL DOOR OPENINGS, SEE FLOOR PLANS.
6	EXISTING VAULT DOOR FRAME AND DAY GATE TO BE REMOVED - OPENING HEIGHT TO BE ENLARGED. SEE FLOOR PLANS.
7	REMOVE EXISTING ESCALTOR ENTIRELY, PREP AREA FOR NEW STAIR AND ELEVATOR. SEE FLOOR PLANS.
8	REMOVE EXISTING VAULT DOOR AND FRAME, PREP OPENING FOR NEW DOOR - SEE FLOOR PLAN.
9	CUT NEW OPENING IN EXISTING CONCRETE FLOOR STRUCTURE. SEE STRUCTURAL FOR MORE INFORMATION. EXACT DIMENSIONS ARE TO BE VERIFIED IN THE FIELD BASED ON EXISTING STRUCTURE
10	CUT NEW OPENING IN EXISTING CONCRETE ROOF STRUCTURE. SEE STRUCTURAL FOR MORE INFORMATION. EXACT DIMENSIONS ARE TO BE VERIFIED IN THE FIELD BASED ON EXISTING STRUCTURE
11	BID ALTERNATE 12 - REMOVE AND SALVAGE EXISTING STONE BALLAST, REMOVE AND DISCARD EXISTING ROOF MEMBRANE, EXISTING INSULATION TO REMAIN. PREP FOR NEW ROOFING. SEE ROOF PLAN.
12	ALTERNATE BID 2 - REMOVE EXISTING ALUMINUM CURTAINWALL OR STOREFRONT GLAZING SYSTEM. PREP OPENING FOR NEW STOREFRONT OR CURTAINWALL - SEE FLOOR PLANS.
13	ALTERNATE BID 3 - REMOVE EXISTING PRECAST CONCRETE COLUMN WRAP
14	ALTERNATE BID 3 - REMOVE EXISTING PRECAST CONCRETE CANOPY FASCIA
15	BID ALTERNATE 12 - REMOVE EXISTING PARAPET FASTENED TERMINATION BAR. PREPARE FOR NEW MEMBRANE. SEE ROOF PLAN
16	EXISTING ROOF HATCH TO REMAIN
17	REMOVE EXISTING LIGHTING AND PATCH PRECAST PANEL TO MATCH
19	REMOVE EXISTING DOOR AND FRAME IN ITS ENTIRETY
20	EXISTING TENANT SPACE TO REMAIN OPERATIONAL DURING CONSTRUCTION. SELECTIVE DEMOLITION AS REQUIRED FOR INSTALALTION OF SPRINKLER SYSTEM AND WINDOW REPLACEMENT (ALTERNATE BID)
21	EXISTING CONCRETE SLAB ON GRADE FLOOR TO BE SAW CUT AND REMOVED AS REQUIRED FOR INSTALLATION OF NEW UNDERSLAB PLUMBING AND ELECTRICAL. AREAS SHOWN ARE FOR REFERENCE ONLY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM EXACT SLAB CUTTING REQUIRED TO ACCOMODATE NEW CONSTRUCTION. SEE MEP DRAWINGS FOR MORE INFORMATION. SEE STRUCTURAL DRAWINGS FOR SLAB IN-FILL DETAIL.
22	EXISTING CONCRETE RAMP TO BE REMOVED. SEE STRUCTURAL DRAWINGS FOR MORE INFORMATION.
23	EXISTING STAIR TO REMAIN
24	EXISTING TRANFORMER ROOM TO REMAIN - SEE ELECTRICAL FOR MORE INFORMATION
25	ALTERNATE BID: EXISTING 1ST FLOOR PERIMETER WALL INSULATION AND GYPSUM BOARD TO BE REMOVED. PREP CONCRETE WALL FOR NEW INSULATION AND FURRING. SEE FLOOR PLAN AND TYPICAL ASSEMBLIES FOR MORE INFORMATION. EXTENTS OF PERIMETER INSULATION/WALL REPLACEMENT DO NOT INCLUDE CURRENT DENTIST OFFICE (NW CORNER). BASE BID: EXISTING PERIMETER WALL INSULATION AND GYPSUM BOARD TO REMAIN.
26	ALTERNATE BID: EXISTING 2ND/3RD FLOOR PERIMETER GYPSUM BOARD, METAL STUD FRAMING, AND BATT INSULATION TO BE REMOVED. PREP BACKSIDE OF EXISTING PRECAST PANELS FOR NEW INSULATION AND FURRING. SEE FLOOR PLAN AND TYPICAL ASSEMBLIES FOR MORE INFORMATION. BASE BID: EXISTING 2ND/3RD FLOOR PERIMETER GYPSUM BOARD, METAL STUD FRAMING, AND BATT INSULATION TO REMAIN.
27	EXISTING COOLING TOWER, TO BE RELOCATED. SEE MEP DRAWINGS FOR MORE INFORMATION. PATCH EXISTING ROOF AS REQUIRED.
28	APPROXIMATE LOCATION OF RELOCATED COOLING TOWER. TIE CURB INTO EXISTING ROOFING. SEE MEP AND STRUCTURAL DRAWINGS FOR MORE INFORMATION.
29	APPROXIMATE LOCATION OF NEW ROOFTUP MECHANICAL UNIT. TIE CURB INTO EXISTING ROOFING.
30	APPROXIMATE EXTENTS OF FLOOR SLAB DEMO REQ'D FOR NEW PLUMBING &/OR ELECTRICAL - SEE MECH & ELEC DWG'S

DEMOLITION GENERAL NOTES

A. THE OWNER'S NORMAL OPERATIONS WILL BE CONTINUED DURING DEMOLITION. DEMOLITION CONTRACTOR SHALL NOT INTERFERE WITH THESE OPERATIONS IN ANY WAY WITHOUT THE OWNER'S EXPRESSED CONSENT.
B. OWNER WILL OCCUPY PORTIONS OF THE BUILDING IMMEDIATELY ADJACENT TO AREAS OF SELECTIVE DEMOLITION. CONDUCT SELECTIVE DEMOLITION WORK IN MANNER THAT WILL MINIMIZE NEED FOR DISRUPTION OF OWNER'S NORMAL OPERATIONS. REFER TO SPECIFICATIONS FOR MINIMUM ADVANCE NOTICE TO OWNER.
C. PROVIDE TEMPORARY BARRICADES AND OTHER FORMS OF PROTECTION TO PROTECT OWNER'S PERSONNEL AND GENERAL PUBLIC FROM INJURY DUE TO SELECTIVE DEMOLITION WORK.
D. PROVIDE 1 - HOUR FIRE RESISTANT CONSTRUCTION BARRIERS WHERE REQ'D TO PROTECT EXISTING CONSTRUCTION AND OWNERS OPERATIONS.
E. PROTECT FROM DAMAGE EXISTING FINISH WORK THAT IS TO REMAIN IN PLACE AND BECOME EXPOSED DURING DEMOLITION OPERATIONS.
F. PROTECT FLOORS WITH SUITABLE COVERING WHEN NECESSARY.
G. COVER AND PROTECT FURNITURE, EQUIPMENT, AND FIXTURES FROM SOILAGE OR DAMAGE WHEN DEMOLITION WORK IS PERFORMED IN AREAS WHERE SUCH ITEMS HAVE NOT BEEN REMOVED.
H. PRIOR TO CUTTING EXISTING CONSTRUCTION, LOCATE AND IDENTIFY SERVICES TO REMAIN IN OPERATION, INCLUDING ALL FLOOR PENETRATIONS. UNDOCUMENTED CONDITIONS, UTILITY RISERS, ETC. AND ANY WALLS THAT CONTAIN LIFE SAFETY VERTICAL RISERS THAT MUST REMAIN IN OPERATION DURING THE DEMOLITION WORK.
I. CONTRACTOR SHALL VERIFY ALL EXISTING BUILDING DIMENSIONS, PARTITION AND WALL LOCATIONS AND FLOOR ELEVATIONS IN FIELD AND NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES BEFORE THE START OF WORK.
J. WHEN UNANTICIPATED MECHANICAL, ELECTRICAL, OR STRUCTURAL ELEMENTS THAT CONFLICT WITH INTENDED FUNCTION OF DESIGN ARE ENCOUNTERED,INVESTIGATE AND MEASURE BOTH NATURE AND EXTENT OF THE CONFLICT AND NOTIFY OWNER'S REPRESENTATIVE.
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S. SEE MECHANICAL, CIVIL, AND ELECTRICAL DEMOLITION DRAWINGS FOR ADDITIONAL SCOPE OF DEMOLITION WORK.
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2 6A A103 THIRD FLOOR DEMOLITION PLAN
SCALE: 1/8" = 1'-0"

NORTH

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
7360
11 | 04 | 2021
STATE OF NORTH DAKOTA

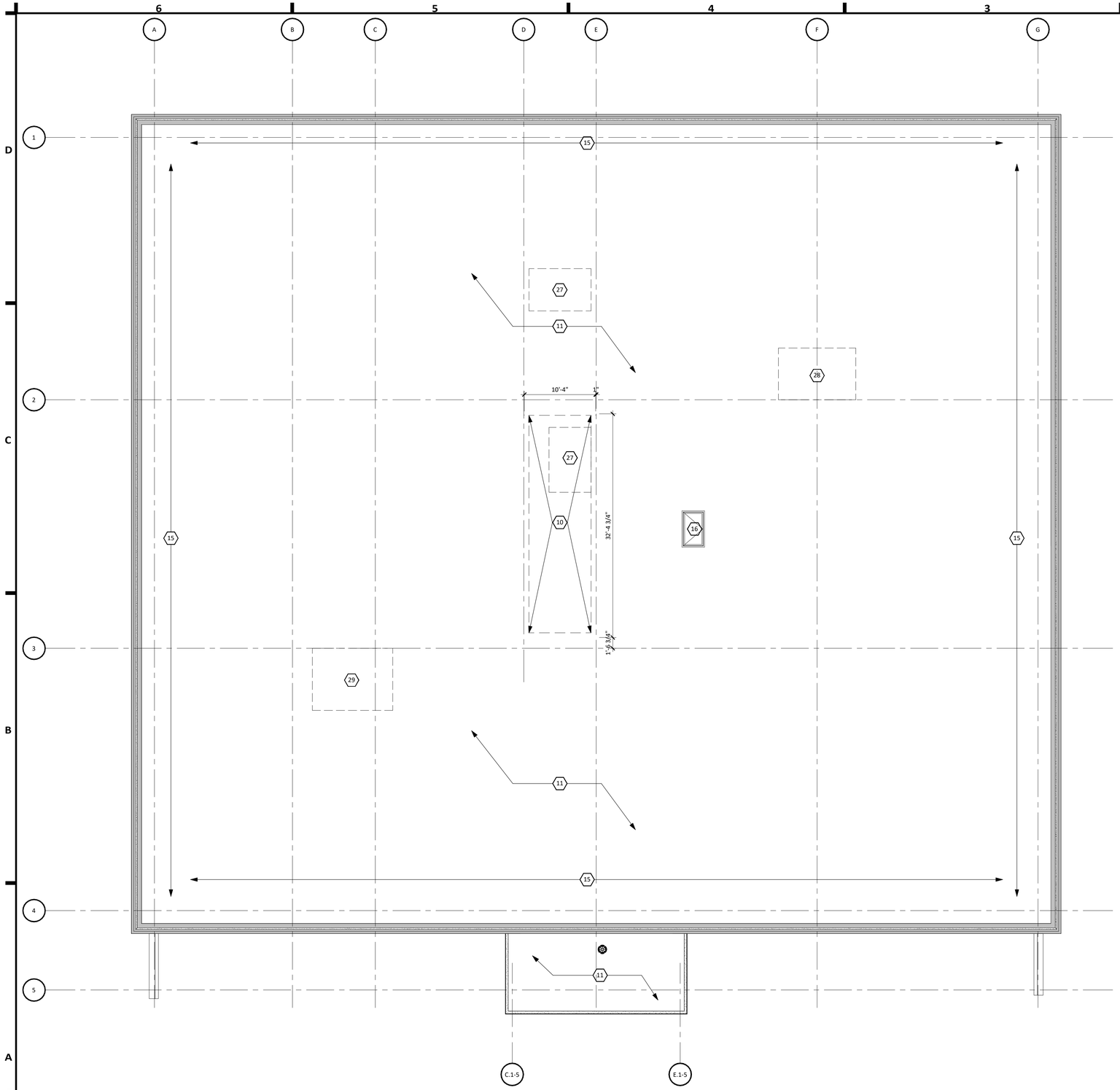
REVISION SCHEDULE

NO.	DESCRIPTION	DATE
2	ADDENDUM 2	11/18/21

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE
11/04/21
PHASE
CONSTRUCTION DOCUMENTS
PROJECT
21019
SHEET
A103
THIRD FLOOR DEMOLITION PLAN

11/18/2021 9:15:46 PM



6A
A104
ROOF PLAN - DEMOLITION
SCALE: 1/8" = 1'-0"

DEMOLITION KEYNOTES

KEYNOTE	DESCRIPTION
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DEMOLITION LEGEND

- EXISTING WALL/OBJECT TO REMAIN
- EXISTING WALL/OBJECT TO BE REMOVED
- EXISTING DOOR, FRAME, AND TRIM TO REMAIN
- EXISTING DOOR, FRAME, AND TRIM TO BE REMOVED

FOR ENTIRE SHADED AREA:
-COMPLETELY REMOVE DASHED WALLS (DEMO WALLS)
-COMPLETELY REMOVE DOORS, FRAMES, AND TRIM, U.N.O.
-COMPLETELY REMOVE ALL EXISTING FLOOR FINISHES.
-COMPLETELY REMOVE CEILINGS AND CLG MTD ITEMS, U.N.O.
-REMOVE ALL EXISTING CASEWORK
-REMOVE ALL EXISTING FLOOR AND WALL MTD ITEMS AND TRIM.
-REMOVE ALL PLUMBING FIXTURES & ASSOCIATED ITEMS.
-SEE M.E.P. & STRUCT. DRAWINGS FOR MORE INFORMATION.

- DEMOLITION KEYNOTE

ALL DEMOLITION WORK REQUIRED IS NOT NECESSARILY LIMITED TO WHAT IS SHOWN ON THE DEMOLITION PLANS. THE INTENT IS TO REMOVE ALL MECHANICAL, ELECTRICAL AND ARCHITECTURAL ITEMS AS REQUIRED TO FACILITATE NEW CONSTRUCTION.

REFER TO FINISH SCHEDULE FOR ADDITIONAL FINISH WORK REQUIRED IN OTHER AREAS THAT ARE NOT DOCUMENTED TO RECEIVE AND DEMOLITION/REMOVAL WORK INDICATED ON DEMOLITION PLANS (TYPICAL).

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
7369
DATE 11.04.2021
STATE OF NORTH DAKOTA

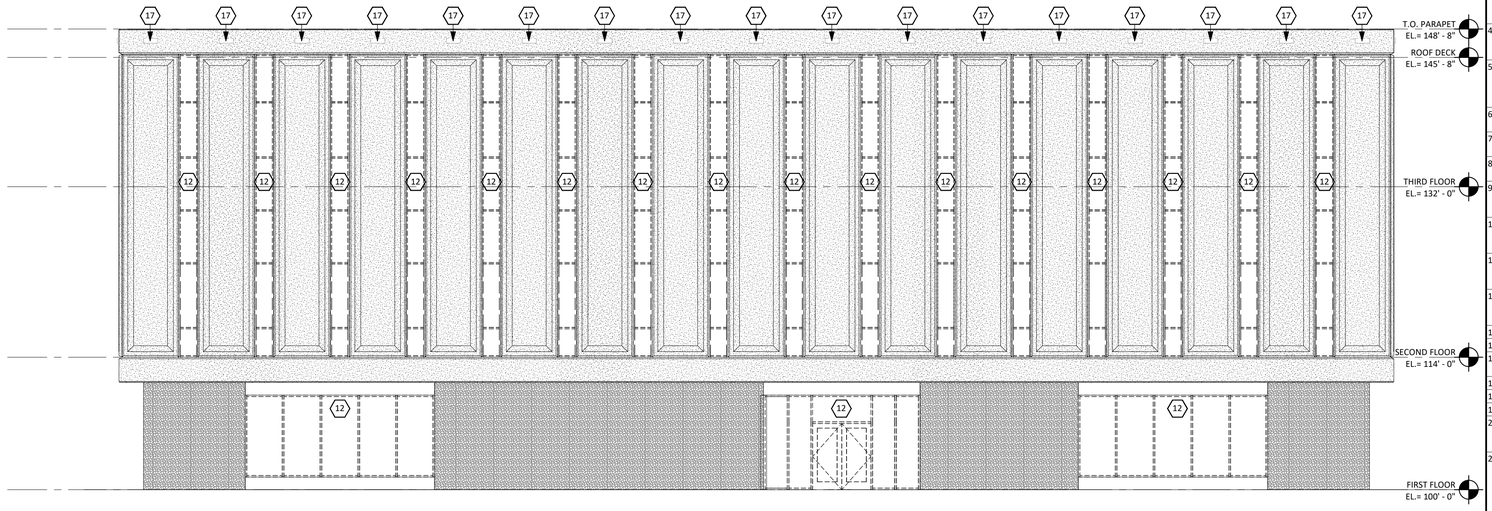
REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

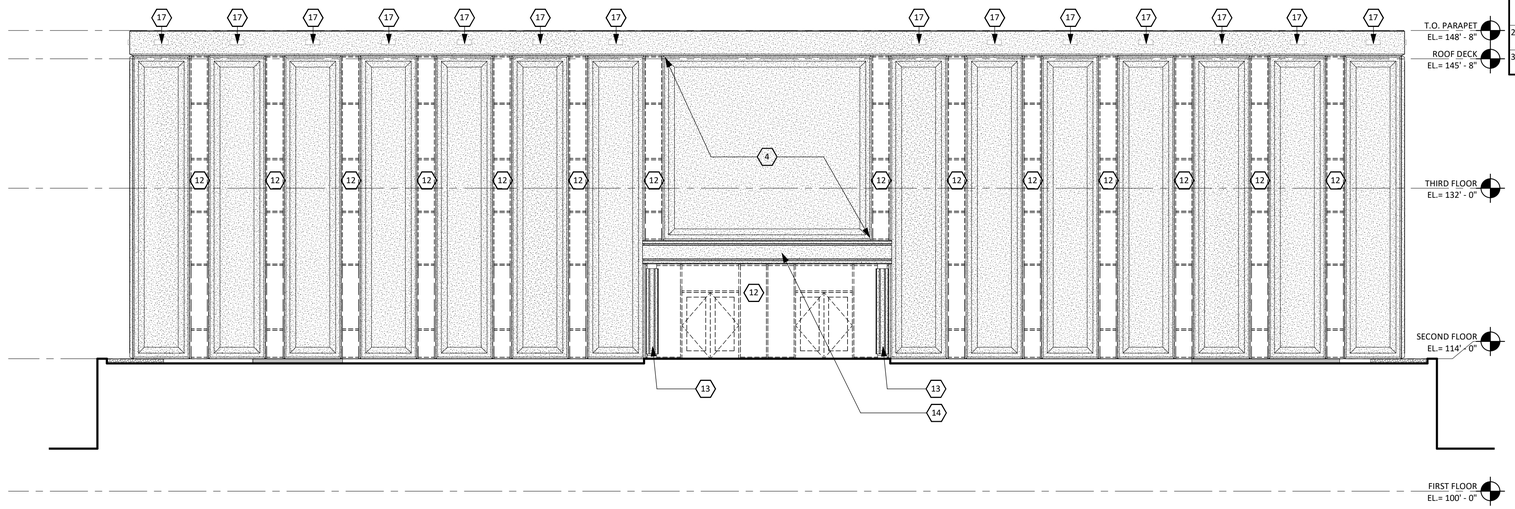
CITY PROJECT 4466
DATE
11/04/21
PHASE
CONSTRUCTION DOCUMENTS
PROJECT
21019
SHEET
A104
ROOF DEMOLITION PLAN

11/4/2021 10:10:28 AM



6C / A110 DEMOLITION ELEVATION - NORTH

SCALE: 1/8" = 1'-0"



6A / A110 DEMOLITION ELEVATION - SOUTH

SCALE: 1/8" = 1'-0"

DEMOLITION KEYNOTES

KEYNOTE	DESCRIPTION
1	REMOVE PORTION OF ESCALTOR PIT AS REQUIRED FOR NEW ELEVATOR PIT - SEE VERTICAL CIRCULATION AND STRUCTURAL DRAWINGS
2	EXISTING ELEVATOR TO REMAIN.
3	EXISTING STAIRWELL; REMOVE EXISTING FLOORING AT TREADS, RISERS, AND LANDINGS. PREP FOR NEW FLOORING. SEE FINISH PLANS FOR MORE INFORMATION. EXISTING RAILINGS ARE TO REMAIN
4	ALTERNATE BID - REMOVE PRECAST PANELS & PREP EXISTING CONCRETE STRUCTURE FOR NEW CURTAINWALL INSTALLATION - SEE ALTERNATE PLANS & ELEVATIONS
5	EXISTING ELEVATOR CAB AND ALL ASSOCIATED EQUIPMENT IS TO BE REMOVED. HOISTWAY TO BE USED FOR NEW MECHANICAL CHASE. SEE MEP DRAWINGS FOR MORE INFORMATION. INFILL DOOR OPENINGS, SEE FLOOR PLANS.
6	EXISTING VAULT DOOR FRAME AND DAY GATE TO BE REMOVED - OPENING HEIGHT TO BE ENLARGED. SEE FLOOR PLANS.
7	REMOVE EXISTING ESCALTOR ENTIRELY, PREP AREA FOR NEW STAIR AND ELEVATOR. SEE FLOOR PLANS.
8	REMOVE EXISTING VAULT DOOR AND FRAME, PREP OPENING FOR NEW DOOR - SEE FLOOR PLAN.
9	CUT NEW OPENING IN EXISTING CONCRETE FLOOR STRUCTURE. SEE STRUCTURAL FOR MORE INFORMATION. EXACT DIMENSIONS ARE TO BE VERIFIED IN THE FIELD BASED ON EXISTING STRUCTURE
10	CUT NEW OPENING IN EXISTING CONCRETE ROOF STRUCTURE. SEE STRUCTURAL FOR MORE INFORMATION. EXACT DIMENSIONS ARE TO BE VERIFIED IN THE FIELD BASED ON EXISTING STRUCTURE
11	BID ALTERNATE 12 - REMOVE AND SALVAGE EXISTING STONE BALLAST, REMOVE AND DISCARD EXISTING ROOF MEMBRANE, EXISTING INSULATION TO REMAIN. PREP FOR NEW ROOFING. SEE ROOF PLAN.
12	ALTERNATE BID 2 - REMOVE EXISTING ALUMINUM CURTAINWALL OR STOREFRONT GLAZING SYSTEM. PREP OPENING FOR NEW STOREFRONT OR CURTAINWALL - SEE FLOOR PLANS.
13	ALTERNATE BID 3 - REMOVE EXISTING PRECAST CONCRETE COLUMN WRAP
14	ALTERNATE BID 3 - REMOVE EXISTING PRECAST CONCRETE CANOPY FASCIA
15	BID ALTERNATE 12 - REMOVE EXISTING PARAPET FASTENED TERMINATION BAR. PREPARE FOR NEW MEMBRANE. SEE ROOF PLAN
16	EXISTING ROOF HATCH TO REMAIN
17	REMOVE EXISTING LIGHTING AND PATCH PRECAST PANEL TO MATCH
19	REMOVE EXISTING DOOR AND FRAME IN ITS ENTIRETY
20	EXISTING TENANT SPACE TO REMAIN OPERATIONAL DURING CONSTRUCTION. SELECTIVE DEMOLITION AS REQUIRED FOR INSTALALTION OF SPRINKLER SYSTEM AND WINDOW REPLACEMENT (ALTERNATE BID)
21	EXISTING CONCRETE SLAB ON GRADE FLOOR TO BE SAW CUT AND REMOVED AS REQUIRED FOR INSTALLATION OF NEW UNDERSLAB PLUMBING AND ELECTRICAL. AREAS SHOWN ARE FOR REFERENCE ONLY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM EXACT SLAB CUTTING REQUIRED TO ACCOMODATE NEW CONSTRUCTION. SEE MEP DRAWINGS FOR MORE INFORMATION. SEE STRUCTURAL DRAWINGS FOR SLAB IN-FILL DETAIL.
22	EXISTING CONCRETE RAMP TO BE REMOVED. SEE STRUCTURAL DRAWINGS FOR MORE INFORMATION.
23	EXISTING STAIR TO REMAIN
24	EXISTING TRANFORMER ROOM TO REMAIN - SEE ELECTRICAL FOR MORE INFORMATION
25	ALTERNATE BID: EXISTING 1ST FLOOR PERIMETER WALL INSULATION AND GYPSUM BOARD TO BE REMOVED. PREP CONCRETE WALL FOR NEW INSULATION AND FURRING. SEE FLOOR PLAN AND TYPICAL ASSEMBLIES FOR MORE INFORMATION. EXTENTS OF PERIMETER INSULATION/WALL REPLACEMENT DO NOT INCLUDE CURRENT DENTIST OFFICE (NW CORNER). BASE BID: EXISTING PERIMETER WALL INSULATION AND GYPSUM BOARD TO REMAIN.
26	ALTERNATE BID: EXISTING 2ND/3RD FLOOR PERIMETER GYPSUM BOARD, METAL STUD FRAMING, AND BATT INSULATION TO BE REMOVED. PREP BACKSIDE OF EXISTING PRECAST PANELS FOR NEW INSULATION AND FURRING. SEE FLOOR PLAN AND TYPICAL ASSEMBLIES FOR MORE INFORMATION. BASE BID: EXISTING 2ND/3RD FLOOR PERIMETER GYPSUM BOARD, METAL STUD FRAMING, AND BATT INSULATION TO REMAIN.
27	EXISTING COOLING TOWER, TO BE RELOCATED. SEE MEP DRAWINGS FOR MORE INFORMATION. PATCH EXISTING ROOF AS REQUIRED.
28	APPROXIMATE LOCATION OF RELOCATED COOLING TOWER. TIE CURB INTO EXISTING ROOFING. SEE MEP AND STRUCTURAL DRAWINGS FOR MORE INFORMATION.
29	APPROXIMATE LOCATION OF NEW ROOFTUP MECHANICAL UNIT. TIE CURB INTO EXISTING ROOFING.
30	APPROXIMATE EXTENTS OF FLOOR SLAB DEMO REQ'D FOR NEW PLUMBING &/OR ELECTRICAL - SEE MECH & ELEC DWG'S

DEMOLITION GENERAL NOTES

A. THE OWNER'S NORMAL OPERATIONS WILL BE CONTINUED DURING DEMOLITION. DEMOLITION CONTRACTOR SHALL NOT INTERFERE WITH THESE OPERATIONS IN ANY WAY WITHOUT THE OWNER'S EXPRESSED CONSENT.
B. OWNER WILL OCCUPY PORTIONS OF THE BUILDING IMMEDIATELY ADJACENT TO AREAS OF SELECTIVE DEMOLITION. CONDUCT SELECTIVE DEMOLITION WORK IN MANNER THAT WILL MINIMIZE NEED FOR DISRUPTION OF OWNER'S NORMAL OPERATIONS. REFER TO SPECIFICATIONS FOR MINIMUM ADVANCE NOTICE TO OWNER.
C. PROVIDE TEMPORARY BARRICADES AND OTHER FORMS OF PROTECTION TO PROTECT OWNER'S PERSONNEL AND GENERAL PUBLIC FROM INJURY DUE TO SELECTIVE DEMOLITION WORK.
D. PROVIDE 1 - HOUR FIRE RESISTANT CONSTRUCTION BARRIERS WHERE REQ'D TO PROTECT EXISTING CONSTRUCTION AND OWNERS OPERATIONS.
E. PROTECT FROM DAMAGE EXISTING FINISH WORK THAT IS TO REMAIN IN PLACE AND BECOME EXPOSED DURING DEMOLITION OPERATIONS.
F. PROTECT FLOORS WITH SUITABLE COVERING WHEN NECESSARY.
G. COVER AND PROTECT FURNITURE, EQUIPMENT, AND FIXTURES FROM SOILAGE OR DAMAGE WHEN DEMOLITION WORK IS PERFORMED IN AREAS WHERE SUCH ITEMS HAVE NOT BEEN REMOVED.
H. PRIOR TO CUTTING EXISTING CONSTRUCTION, LOCATE AND IDENTIFY SERVICES TO REMAIN IN OPERATION, INCLUDING ALL FLOOR PENETRATIONS. UNDOCUMENTED CONDITIONS, UTILITY RISERS, ETC. AND ANY WALLS THAT CONTAIN LIFE SAFETY VERTICAL RISERS THAT MUST REMAIN IN OPERATION DURING THE DEMOLITION WORK.
I. CONTRACTOR SHALL VERIFY ALL EXISTING BUILDING DIMENSIONS, PARTITION AND WALL LOCATIONS AND FLOOR ELEVATIONS IN FIELD AND NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES BEFORE THE START OF WORK.
J. WHEN UNANTICIPATED MECHANICAL, ELECTRICAL, OR STRUCTURAL ELEMENTS THAT CONFLICT WITH INTENDED FUNCTION OF DESIGN ARE ENCOUNTERED,INVESTIGATE AND MEASURE BOTH NATURE AND EXTENT OF THE CONFLICT AND NOTIFY OWNER'S REPRESENTATIVE.
K. MAINTAIN EXISTING UTILITIES INDICATED TO REMAIN IN SERVICE AND PROTECT THEM AGAINST DAMAGE DURING DEMOLITION OPERATIONS. DO NOT INTERRUPT UTILITIES SERVING OCCUPIED OR USED FACILITIES, EXCEPT WHEN AUTHORIZED IN WRITING BY AUTHORITIES HAVING JURISDICTION.
L. WHERE DEMOLITION IS REQ'D BEYOND THE LIMITS OF THE CONTRACT TO ROUTE NEW DUCTWORK, PIPING, CONDUITS ETC., RATED WALLS AND SMOKE BARRIERS SHALL BE PATCHED BY CONTRACTOR REQUIRING PENETRATIONS, ALL FINISHES DAMAGED BY THE WORK SHALL BE RESTORED TO THEIR ORIGINAL CONDITION.
M. REPAIR DEMOLITION PERFORMED IN EXCESS OF THAT REQ'D. RETURN ELEMENTS OF CONSTRUCTION AND SURFACES TO REMAIN, TO THE CONDITION EXISTING PRIOR TO START OF OPERATIONS. REPAIR ADJACENT CONSTRUCTION OR SURFACES SOILED OR DAMAGED BY SELECTIVE DEMOLITION.
N. PROVIDE SHORING, BRACING AND ANY OTHER MEANS REQ'D TO PROTECT AND MAINTAIN THE SAFETY, INTEGRITY AND STABILITY OF ALL EXISTING AND NEW CONSTRUCTION.
O. WHEN ROOFING, GLAZING, FLASHING, COPING OR PORTIONS OF EXTERIOR WALLS ARE REMOVED OR OPENED, SUITABLE WEATHER PROTECTION SHALL BE PROVIDED AND MAINTAINED FOR THE DURATION OF WORK.
P. REMOVAL OF ITEMS NOTED INCLUDES REMOVAL OF ANCHORS, ADHESIVES, HARDWARE, CONDUIT, WIRE, PIPING, ETC. FOR A COMPLETE REMOVAL OF THE ITEMS OR SYSTEMS.
Q. WHEREVER WATER CLOSETS, FLOOR SINKS OR OTHER EQUIPMENT AND RELATED PIPING ARE TO BE REMOVED, PATCH FLOOR SLAB W/ CONCRETE AS REQUIRED.
R. ALL CONCRETE FLOOR SLABS NOTED TO BE REMOVED SHALL BE SAWCUT TO PROVIDE A NEAT JOINT.
S. SEE MECHANICAL, CIVIL, AND ELECTRICAL DEMOLITION DRAWINGS FOR ADDITIONAL SCOPE OF DEMOLITION WORK.
T. DEMOLITION OF ANY EXISTING CONSTRUCTION SHALL INCLUDE WHAT IS NECESSARY AND REQ'D TO ACCOMMODATE THE REQUIREMENTS OF NEW CONSTRUCTION. REFER TO THE APPROPRIATE DRAWINGS AS TO THE EXTENT OF NEW CONSTRUCTION TO REMAIN.
U. SURFACES SHALL BE CLEANED AND PREPPED WITHIN THE NEW MATERIALS GUIDELINES OF INSTALLATION OF THEIR PRODUCT IN EXISTING CONSTRUCTION.
V. ALL DEMOLITION SHALL COMPLY WITH APPLICABLE LOCAL CODES AND STATE CODES AND ORDINANCES.
W. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS

DEMOLITION LEGEND

- EXISTING WALL/OBJECT TO REMAIN
- EXISTING WALL/OBJECT TO BE REMOVED
- EXISTING DOOR, FRAME, AND TRIM TO REMAIN
- EXISTING DOOR, FRAME, AND TRIM TO BE REMOVED

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-COMPLETELY REMOVE DOORS, FRAMES, AND TRIM, U.N.O.
-COMPLETELY REMOVE ALL EXISTING FLOOR FINISHES.
-COMPLETELY REMOVE CEILINGS AND CLG MTD ITEMS, U.N.O.
-REMOVE ALL EXISTING CASEWORK
-REMOVE ALL EXISTING FLOOR AND WALL MTD ITEMS AND TRIM.
-REMOVE ALL PLUMBING FIXTURES & ASSOCIATED ITEMS.
-SEE M.E.P. & STRUCT. DRAWINGS FOR MORE INFORMATION.

XX - DEMOLITION KEYNOTE

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
DATE 11.04.2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466

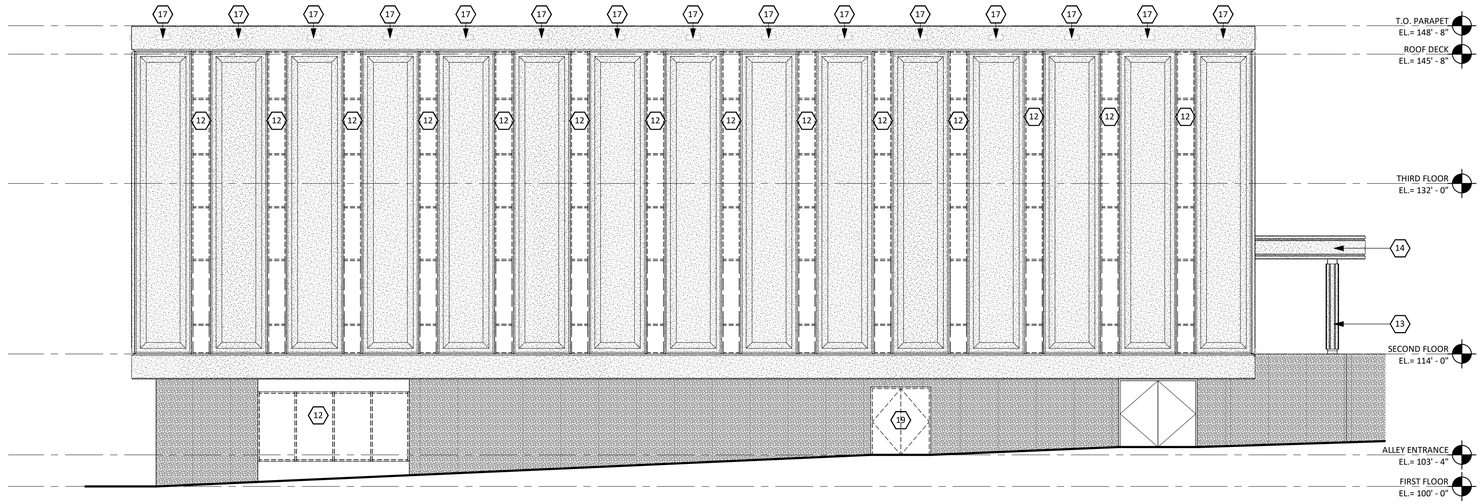
DATE
11/04/21

PHASE
CONSTRUCTION DOCUMENTS

PROJECT
21019

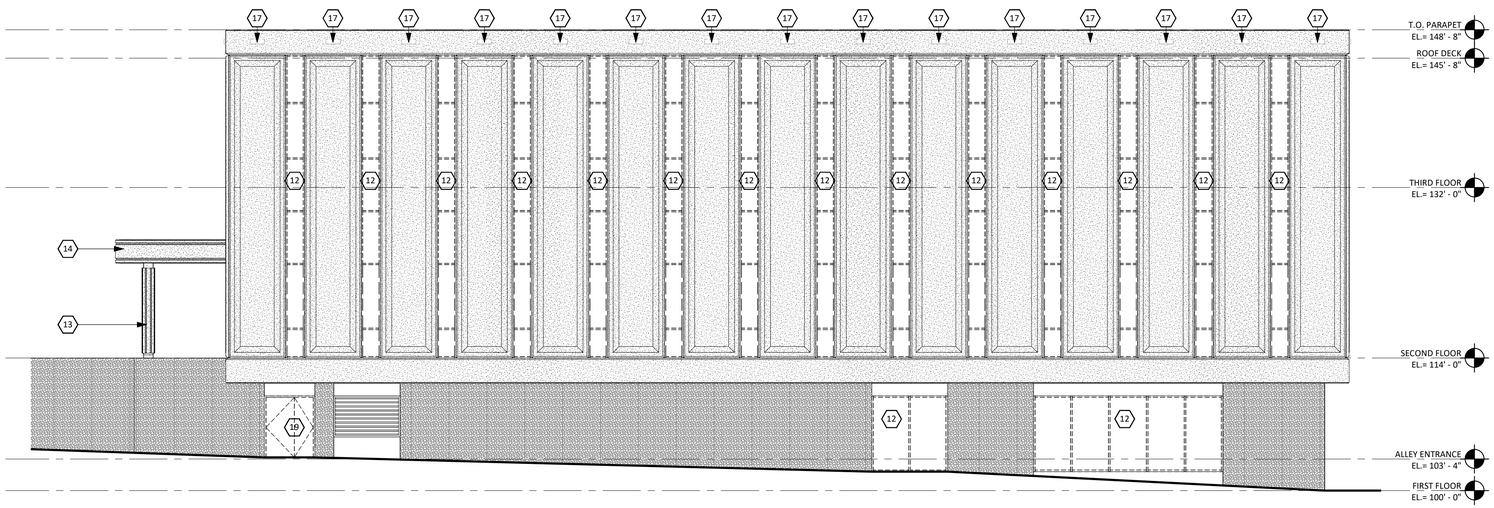
SHEET
A110
DEMOLITION ELEVATIONS

11/4/2021 10:10:35 AM



6C / A111 DEMOLITION ELEVATION - WEST

SCALE: 1/8" = 1'-0"



6A / A111 DEMOLITION ELEVATION - EAST

SCALE: 1/8" = 1'-0"

DEMOLITION KEYNOTES

KEYNOTE	DESCRIPTION
1	REMOVE PORTION OF ESCALTOR PIT AS REQUIRED FOR NEW ELEVATOR PIT - SEE VERTICAL CIRCULATION AND STRUCTURAL DRAWINGS
2	EXISTING ELEVATOR TO REMAIN.
3	EXISTING STAIRWELL; REMOVE EXISTING FLOORING AT TREADS, RISERS, AND LANDINGS. PREP FOR NEW FLOORING. SEE FINISH PLANS FOR MORE INFORMATION. EXISTING RAILINGS ARE TO REMAIN
4	ALTERNATE BID - REMOVE PRECAST PANELS & PREP EXISTING CONCRETE STRUCTURE FOR NEW CURTAINWALL INSTALLATION - SEE ALTERNATE PLANS & ELEVATIONS
5	EXISTING ELEVATOR CAB AND ALL ASSOCIATED EQUIPMENT IS TO BE REMOVED. HOISTWAY TO BE USED FOR NEW MECHANICAL CHASE. SEE MEP DRAWINGS FOR MORE INFORMATION. INFILL DOOR OPENINGS, SEE FLOOR PLANS.
6	EXISTING VAULT DOOR FRAME AND DAY GATE TO BE REMOVED - OPENING HEIGHT TO BE ENLARGED. SEE FLOOR PLANS.
7	REMOVE EXISTING ESCALTOR ENTIRELY, PREP AREA FOR NEW STAIR AND ELEVATOR. SEE FLOOR PLANS.
8	REMOVE EXISTING VAULT DOOR AND FRAME, PREP OPENING FOR NEW DOOR - SEE FLOOR PLAN.
9	CUT NEW OPENING IN EXISTING CONCRETE FLOOR STRUCTURE. SEE STRUCTURAL FOR MORE INFORMATION. EXACT DIMENSIONS ARE TO BE VERIFIED IN THE FIELD BASED ON EXISTING STRUCTURE
10	CUT NEW OPENING IN EXISTING CONCRETE ROOF STRUCTURE. SEE STRUCTURAL FOR MORE INFORMATION. EXACT DIMENSIONS ARE TO BE VERIFIED IN THE FIELD BASED ON EXISTING STRUCTURE
11	BID ALTERNATE 12 - REMOVE AND SALVAGE EXISTING STONE BALLAST, REMOVE AND DISCARD EXISTING ROOF MEMBRANE, EXISTING INSULATION TO REMAIN. PREP FOR NEW ROOFING. SEE ROOF PLAN.
12	ALTERNATE BID 2 - REMOVE EXISTING ALUMINUM CURTAINWALL OR STOREFRONT GLAZING SYSTEM. PREP OPENING FOR NEW STOREFRONT OR CURTAINWALL - SEE FLOOR PLANS.
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28	APPROXIMATE LOCATION OF RELOCATED COOLING TOWER. TIE CURB INTO EXISTING ROOFING. SEE MEP AND STRUCTURAL DRAWINGS FOR MORE INFORMATION.
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C. PROVIDE TEMPORARY BARRICADES AND OTHER FORMS OF PROTECTION TO PROTECT OWNER'S PERSONNEL AND GENERAL PUBLIC FROM INJURY DUE TO SELECTIVE DEMOLITION WORK.
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F. PROTECT FLOORS WITH SUITABLE COVERING WHEN NECESSARY.
G. COVER AND PROTECT FURNITURE, EQUIPMENT, AND FIXTURES FROM SOILAGE OR DAMAGE WHEN DEMOLITION WORK IS PERFORMED IN AREAS WHERE SUCH ITEMS HAVE NOT BEEN REMOVED.
H. PRIOR TO CUTTING EXISTING CONSTRUCTION, LOCATE AND IDENTIFY SERVICES TO REMAIN IN OPERATION, INCLUDING ALL FLOOR PENETRATIONS. UNDOCUMENTED CONDITIONS, UTILITY RISERS, ETC. AND ANY WALLS THAT CONTAIN LIFE SAFETY VERTICAL RISERS THAT MUST REMAIN IN OPERATION DURING THE DEMOLITION WORK.
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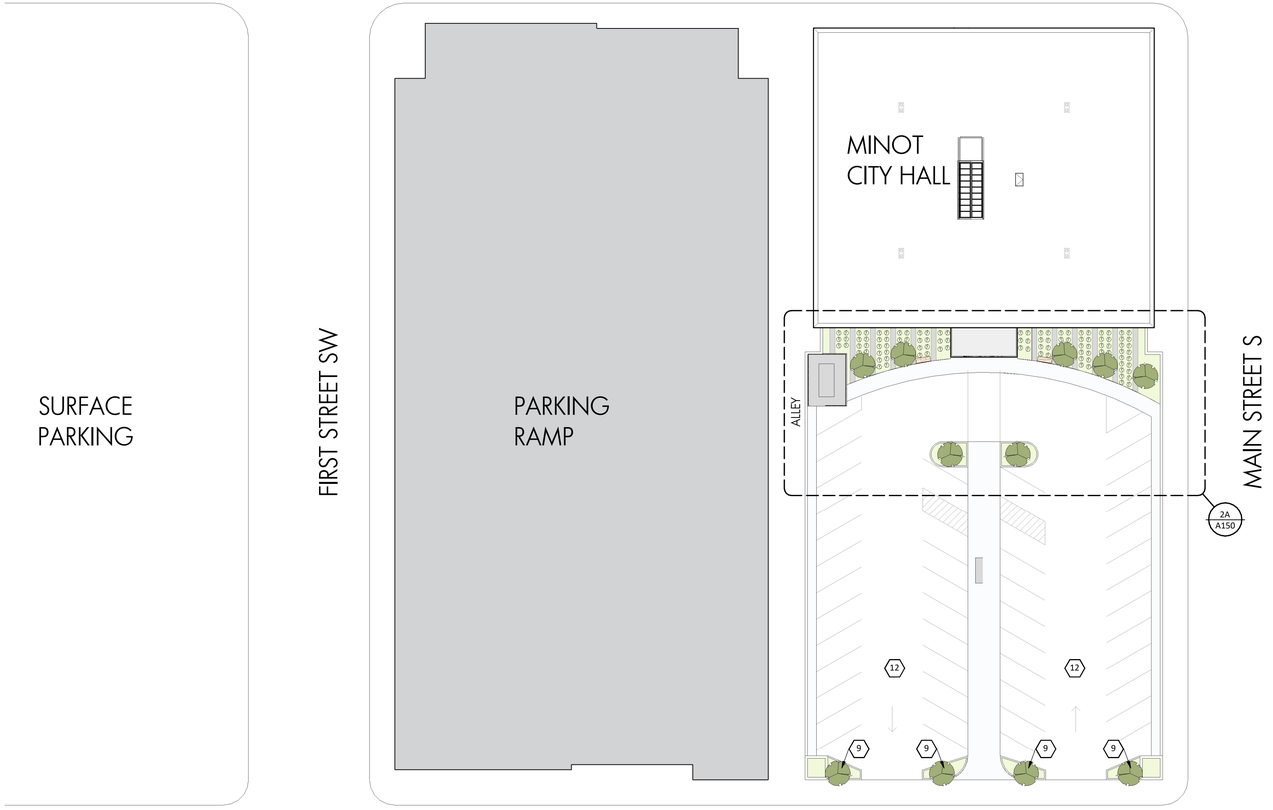
LICENSED ARCHITECT
JENNIFER BURKE JACKSON
DATE 11.04.2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE		
NO.	DESCRIPTION	DATE

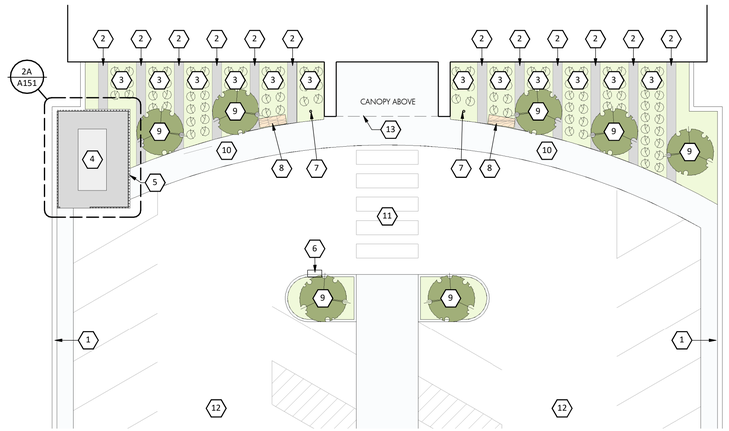
CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE
11/04/21
PHASE
CONSTRUCTION DOCUMENTS
PROJECT
21019
SHEET
A111
DEMOLITION ELEVATIONS

11/4/2021 10:10:42 AM



6B A150 ARCHITECTURAL SITE PLAN
SCALE: 1" = 30'-0"



2A A150 ENLARGED PLAN - LANDSCAPING
SCALE: 1/16" = 1'-0"

ARCHITECTURAL SITE PLAN GENERAL NOTES

A. LANDSCAPING SCOPE IS SHOWN TO CONVEY DESIGN INTENT. ACTUAL LANDSCAPE DESIGN IS BY LANDSCAPING CONTRACTOR. SEE SPEC FOR LANDSCAPE ALLOWANCE REQUIREMENTS.
B. SEE CIVIL DRAWINGS FOR MORE INFORMATION

ARCHITECTURAL SITE PLAN - KEYNOTES

KEYNOTE	Note
1	EXISTING RETAINING WALL AND METAL GUARDRAIL TO REMAIN
2	WOOD MULCH AND METAL EDGING - ALIGNED WITH BUILDING WINDOWS - LANDSCAPE ALLOWANCE
3	DECORATIVE TALL GRASSES IN MULCH BED - LANDSCAPE ALLOWANCE
4	EMERGENCY GENERATOR - SEE ELECTRICAL
5	GENERATOR FENCE ENCLOSURE - SEE DETAILS SHEET A151. SEE CIVIL FOR PAVING REQUIREMENTS WITHIN ENCLOSURE
6	UTILITY BILL DROP BOX - SEE SPEC
7	FLAG POLE - SEE SPEC
8	WOOD BENCH - SEE SPEC
9	DECORATIVE TREE - LANDSCAPE ALLOWANCE
10	NEW CONCRETE WALK - SEE CIVIL
11	PARKING LOT ACCESSIBILITY UPGRADES - SEE CIVIL
12	PARKING LOT STRIPPING - SEE CIVIL
13	CANOPY ABOVE - SEE SECTIONS

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
DATE 11.04.2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

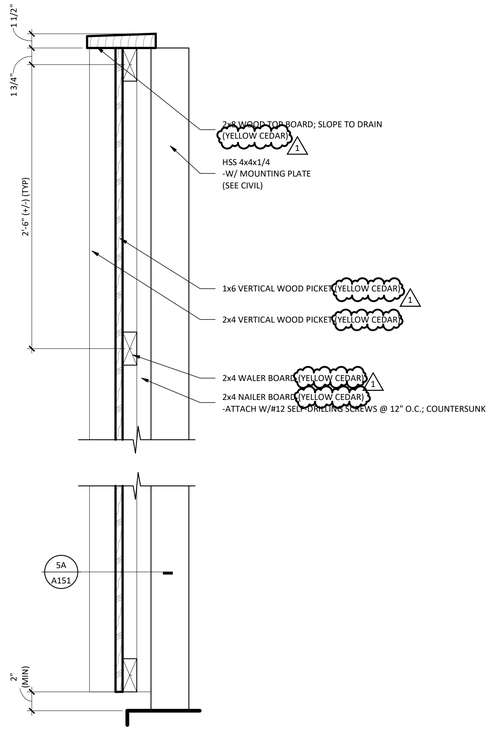
CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A150
SITE PLAN

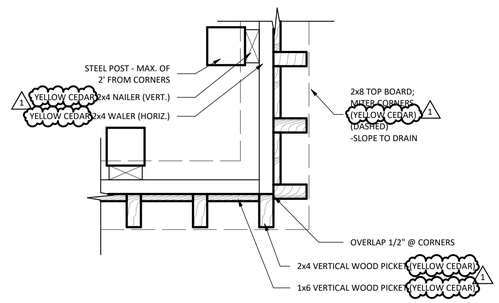
11/4/2021 10:10:49 AM

SHEET MATERIAL ID LIST

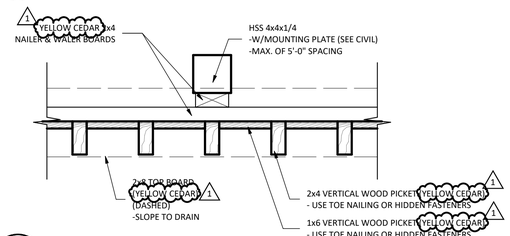
MATERIAL ID	SPEC SECTION & DESCRIPTION



4C A151 FENCE SECTION DETAIL
SCALE: 1 1/2" = 1'-0"



5B A151 FENCE CORNER PLAN DETAIL
SCALE: 1 1/2" = 1'-0"



5A A151 FENCE PLAN DETAIL
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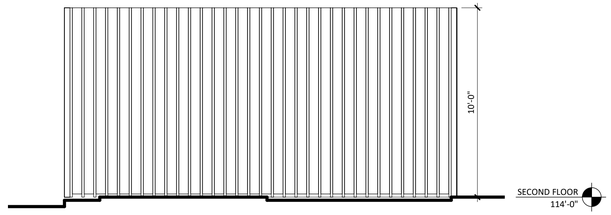
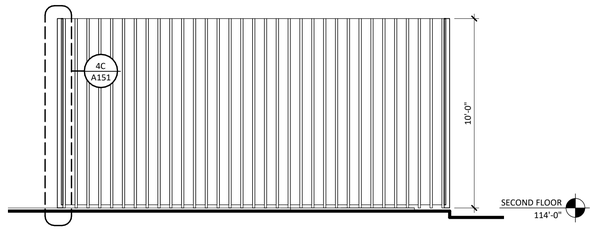


4B A151 GEN. ENCLOSURE - EXT.
SCALE: 1/4" = 1'-0"



4A A151 GEN. ENCLOSURE - INT.
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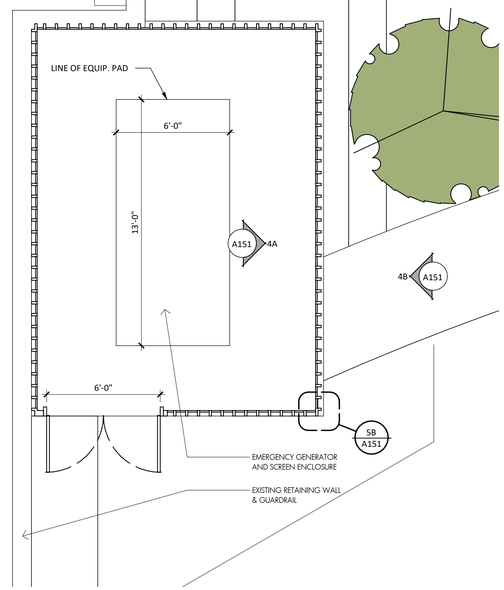

2A A151 GENERATOR ENCLOSURE PLAN
SCALE: 1/4" = 1'-0"

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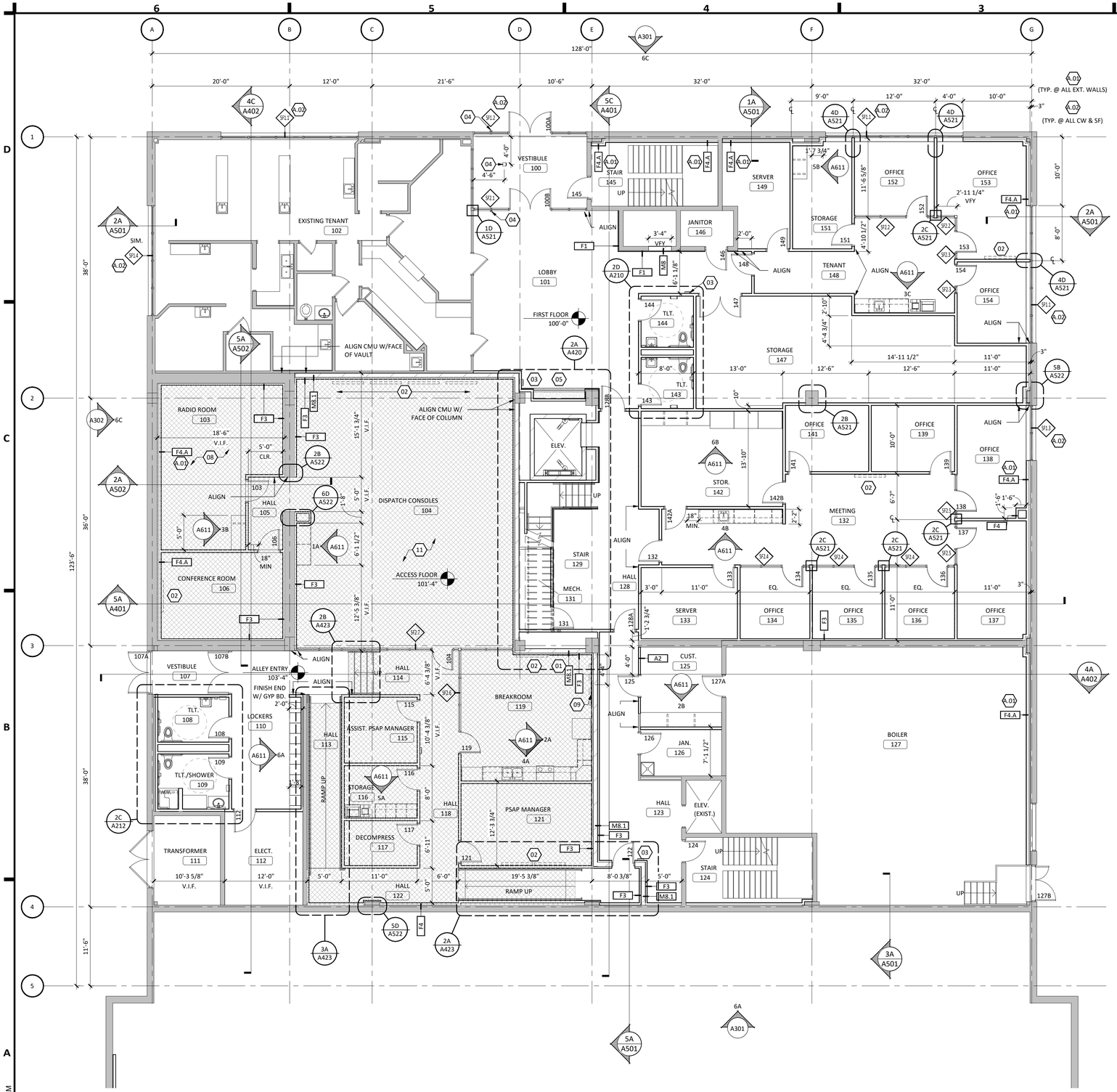
1	ADDENDUM 1	11/12/21

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE
11/04/21
PHASE
CONSTRUCTION DOCUMENTS
PROJECT
21019
SHEET
A151
LANDSCAPE DETAILS

11/12/2021 11:43:26 AM



SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION

FLOOR PLAN KEYNOTES

KEYNOTE	DESCRIPTION
01	4' X 8' WHITE BOARD - TOP OF WHITE BOARD AT 7'-0" ABOVE FINISHED FLOOR
02	WALL MOUNTED MONITOR - REF. ELECTRICAL, TYP. HT. 72" (U.N.O.), CENTER ON WALL (U.N.O.)
03	FIRE EXTINGUISHER CABINET - SEE G-SERIES FOR MOUNTING HEIGHTS
04	AUTOMATIC DOOR OPERATOR ACTUATOR - SEE SPEC FOR MORE INFO
05	DISPLAY CASE - SEE DETAILS
06	FLOOR MOUNTED DIGITAL INFORMATION KIOSK BY OWNER - SEE ELECTRICAL FOR ROUGH IN REQ'S
07	"KNOX BOX" FIRE DEPT. KEY LOCKBOX - SEE SPEC. CONFIRM LOCATION WITH FIRE DEPT. PRIOR TO INSTALLATION
08	PROVIDE 3/4" FIRE TREATED PLYWOOD UP TO 8'-0" A.F.F. AT ENTIRE PERIMETER OF ROOM - TO BE PAINTED
09	5' X 6' TACK BOARD - TOP OF TACK BOARD AT 7'-0" ABOVE FINISHED FLOOR
10	WALL HEIGHT AT 48"
11	EXTENTS OF ACCESS FLOORING (GREY HATCH). SEE ALSO FINISH PLANS.
12	PROVIDE 14"W X 18" H FIRE RATED ACCESS PANEL AT 48" A.F.F. - COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR.
A.01	ALT #1 - EXT. WALL INSULATION - SEE SPECS, TYP. ASSEMBLIES, A900 SERIES
A.02	ALT #2 - EXT. CURTAINWALL/STOREFRONT REPLACEMENT - SEE SPECS, ELEV'S, A900 SERIES
A.03	ALT #3 - EXT. ENTRANCE IMPROVEMENTS - SEE SPECS, ELEV'S, A900 SERIES
A.04	ALT #4 - INCREASED GLAZING - SEE SPECS, ELEV'S, A900 SERIES
A.05	ALT #5 - OPERABLE GLAZED PARTITION @ COUNCIL CHAMBERS - SEE SPECS, A900 SERIES

FLOOR PLAN GENERAL NOTES

A. FOR TYPICAL BARRIER FREE TOILET ROOM TYPES AND ACCESSORIES REQUIREMENTS AND LOCATIONS SEE DWG G120.
B. FOR TYPICAL HOUSEKEEPING CLOSETS ACCESSORIES REQUIREMENTS AND MOUNTING LOCATIONS SEE MOUNTING HEIGHTS SHEET(S).
C. ALL PARTITION TYPES ARE "A4" TYPICALLY UNLESS OTHERWISE NOTED.
D. PROVIDE WALL REINFORCEMENT AT WALL-MOUNTED SHELVES AND STORAGE UNITS, MARKER BOARDS, BULLETIN BOARDS, TACK BOARDS, TELEVISIONS AND OTHER CONTRACTOR OR OWNER FURNISHED WALL-MOUNTED ITEMS.
E. FOR ALL FLOORING TYPE CHANGES BETWEEN ROOMS, TRANSITION SHALL OCCUR AT CENTERLINE OF DOOR PANEL - U.N.O.
F. ALL DIMENSIONS ARE TO FACE OF GYPSUM BOARD U.N.O.
G. ALL DIMENSIONS INDICATED AS 'CLEAR' ARE TO FACE OF FINISH (GYPSUM, TILE, ETC.).
H. ALL EXTERIOR OPENING DIMENSIONS ARE ROUGH OPENINGS.
I. COORDINATE ALL FLOOR OPENING DIMENSIONS AND CLEARANCES FOR DUCTWORK W/ MECHANICAL CONTRACTOR.
J. COORDINATE AND/OR CONFIRM ANY DIMENSIONAL DISCREPENCIES WITH ARCHITECT PRIOR TO INSTALLATION.

6A A201 FIRST FLOOR
SCALE: 1/8" = 1'-0"

11/4/2021 10:10:59 AM

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LICENSED ARCHITECT JENNIFER BURKE JACKSON STATE OF NORTH DAKOTA DATE 11 04 2021

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A201
FIRST FLOOR PLAN

6A A202 SECOND FLOOR PLAN
SCALE: 1/8" = 1'-0"

11/12/2021 11:43:33 AM

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION

FLOOR PLAN KEYNOTES

KEYNOTE	DESCRIPTION
01	4' X 8' WHITE BOARD - TOP OF WHITE BOARD AT 7'-0" ABOVE FINISHED FLOOR
02	WALL MOUNTED MONITOR - REF. ELECTRICAL, TYP. HT. 72" (U.N.O.), CENTER ON WALL (U.N.O.)
03	FIRE EXTINGUISHER CABINET - SEE G-SERIES FOR MOUNTING HEIGHTS
04	AUTOMATIC DOOR OPERATOR ACTUATOR - SEE SPEC FOR MORE INFO
05	DISPLAY CASE - SEE DETAILS
06	FLOOR MOUNTED DIGITAL INFORMATION KIOSK BY OWNER - SEE ELECTRICAL FOR ROUGH IN REQ'S
07	"KNOX BOX" FIRE DEPT. KEY LOCKBOX - SEE SPEC. CONFIRM LOCATION WITH FIRE DEPT. PRIOR TO INSTALLATION
08	PROVIDE 3/4" FIRE TREATED PLYWOOD UP TO 8'-0" A.F.F. AT ENTIRE PERIMETER OF ROOM - TO BE PAINTED
09	5' X 6' TACK BOARD - TOP OF TACK BOARD AT 7'-0" ABOVE FINISHED FLOOR
10	WALL HEIGHT AT 48"
11	EXTENTS OF ACCESS FLOORING (GREY HATCH). SEE ALSO FINISH PLANS.
12	PROVIDE 14"W X 18" H FIRE RATED ACCESS PANEL AT 48" A.F.F. - COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR.
A.01	ALT #1 - EXT. WALL INSULATION - SEE SPECS, TYP. ASSEMBLIES, A900 SERIES
A.02	ALT #2 - EXT. CURTAINWALL/STOREFRONT REPLACEMENT - SEE SPECS, ELEV'S, A900 SERIES
A.03	ALT #3 - EXT. ENTRANCE IMPROVEMENTS - SEE SPECS, ELEV'S, A900 SERIES
A.04	ALT #4 - INCREASED GLAZING - SEE SPECS, ELEV'S, A900 SERIES
A.05	ALT #5 - OPERABLE GLAZED PARTITION @ COUNCIL CHAMBERS - SEE SPECS, A900 SERIES

FLOOR PLAN GENERAL NOTES

A. FOR TYPICAL BARRIER FREE TOILET ROOM TYPES AND ACCESSORIES REQUIREMENTS AND LOCATIONS SEE DWG G120.
B. FOR TYPICAL HOUSEKEEPING CLOSETS ACCESSORIES REQUIREMENTS AND MOUNTING LOCATIONS SEE MOUNTING HEIGHTS SHEET(S).
C. ALL PARTITION TYPES ARE "A4" TYPICALLY UNLESS OTHERWISE NOTED.
D. PROVIDE WALL REINFORCEMENT AT WALL-MOUNTED SHELVES AND STORAGE UNITS, MARKER BOARDS, BULLETIN BOARDS, TACK BOARDS, TELEVISIONS AND OTHER CONTRACTOR OR OWNER FURNISHED WALL-MOUNTED ITEMS.
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H. ALL EXTERIOR OPENING DIMENSIONS ARE ROUGH OPENINGS.
I. COORDINATE ALL FLOOR OPENING DIMENSIONS AND CLEARANCES FOR DUCTWORK W/ MECHANICAL CONTRACTOR.
J. COORDINATE AND/OR CONFIRM ANY DIMENSIONAL DISCREPENCIES WITH ARCHITECT PRIOR TO INSTALLATION.

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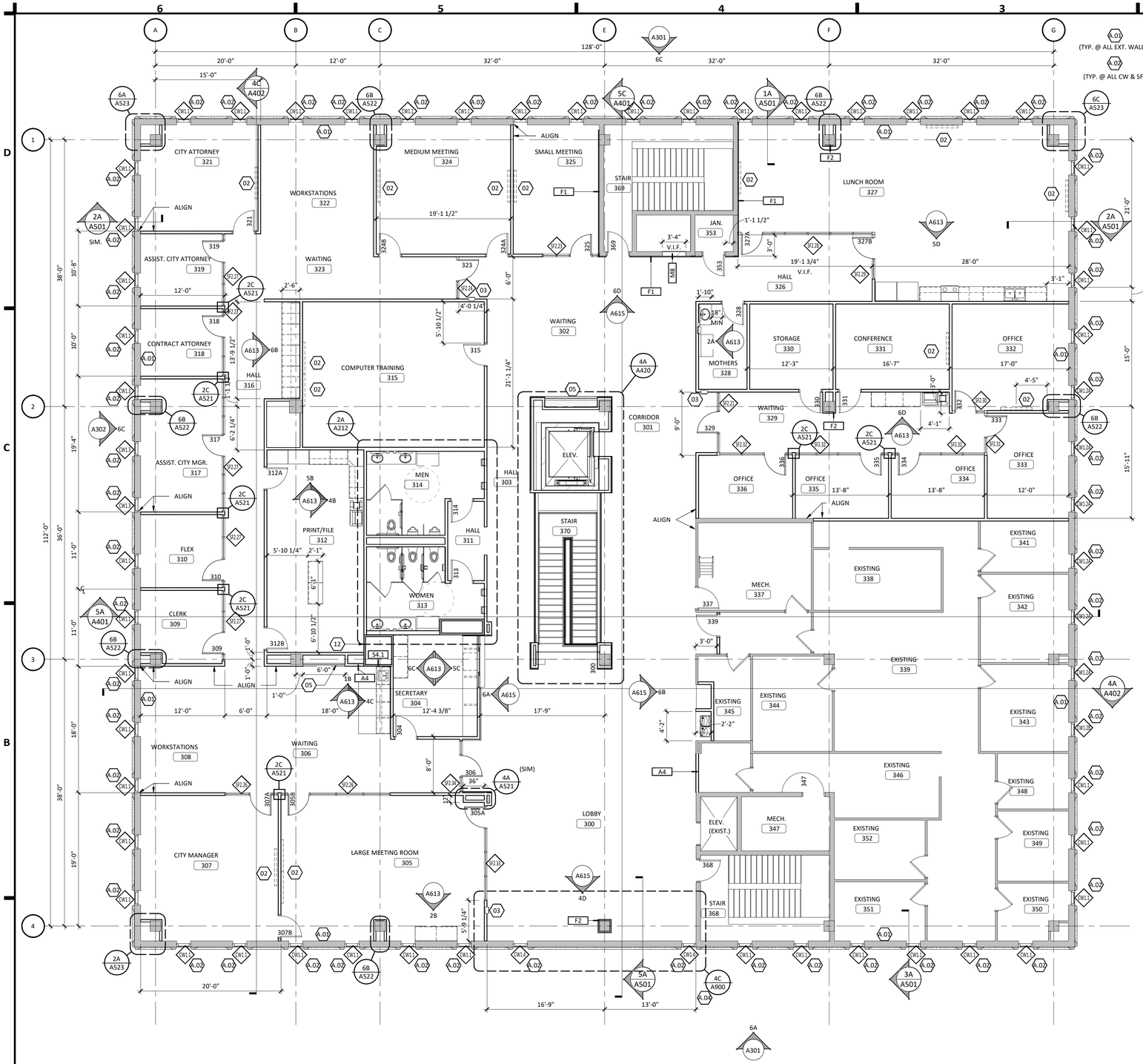
CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A202
SECOND FLOOR PLAN



SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION

FLOOR PLAN KEYNOTES

KEYNOTE	DESCRIPTION
01	4' X 8' WHITE BOARD - TOP OF WHITE BOARD AT 7'-0" ABOVE FINISHED FLOOR
02	WALL MOUNTED MONITOR - REF. ELECTRICAL, TYP. HT. 72" (U.N.O.), CENTER ON WALL (U.N.O.)
03	FIRE EXTINGUISHER CABINET - SEE G-SERIES FOR MOUNTING HEIGHTS
04	AUTOMATIC DOOR OPERATOR ACTUATOR - SEE SPEC FOR MORE INFO
05	DISPLAY CASE - SEE DETAILS
06	FLOOR MOUNTED DIGITAL INFORMATION KIOSK BY OWNER - SEE ELECTRICAL FOR ROUGH IN REQ'S
07	"KNOX BOX" FIRE DEPT. KEY LOCKBOX - SEE SPEC. CONFIRM LOCATION WITH FIRE DEPT. PRIOR TO INSTALLATION
08	PROVIDE 3/4" FIRE TREATED PLYWOOD UP TO 8'-0" A.F.F. AT ENTIRE PERIMETER OF ROOM - TO BE PAINTED
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11	EXTENTS OF ACCESS FLOORING (GREY HATCH). SEE ALSO FINISH PLANS.
12	PROVIDE 14"W X 18" H FIRE RATED ACCESS PANEL AT 48" A.F.F. - COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR.
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A.02	ALT #2 - EXT. CURTAINWALL/STOREFRONT REPLACEMENT - SEE SPECS, ELEV'S, A900 SERIES
A.03	ALT #3 - EXT. ENTRANCE IMPROVEMENTS - SEE SPECS, ELEV'S, A900 SERIES
A.04	ALT #4 - INCREASED GLAZING - SEE SPECS, ELEV'S, A900 SERIES
A.05	ALT #5 - OPERABLE GLAZED PARTITION @ COUNCIL CHAMBERS - SEE SPECS, A900 SERIES

FLOOR PLAN GENERAL NOTES

A. FOR TYPICAL BARRIER FREE TOILET ROOM TYPES AND ACCESSORIES REQUIREMENTS AND LOCATIONS SEE DWG G120.
B. FOR TYPICAL HOUSEKEEPING CLOSETS ACCESSORIES REQUIREMENTS AND MOUNTING LOCATIONS SEE MOUNTING HEIGHTS SHEET(S).
C. ALL PARTITION TYPES ARE "A4" TYPICALLY UNLESS OTHERWISE NOTED.
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G. ALL DIMENSIONS INDICATED AS 'CLEAR' ARE TO FACE OF FINISH (GYPSUM, TILE, ETC.).
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JENNIFER BURKE JACKSON
7369
DATE 11 04 2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE		
NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A203
THIRD FLOOR PLAN

6A A203 THIRD FLOOR PLAN
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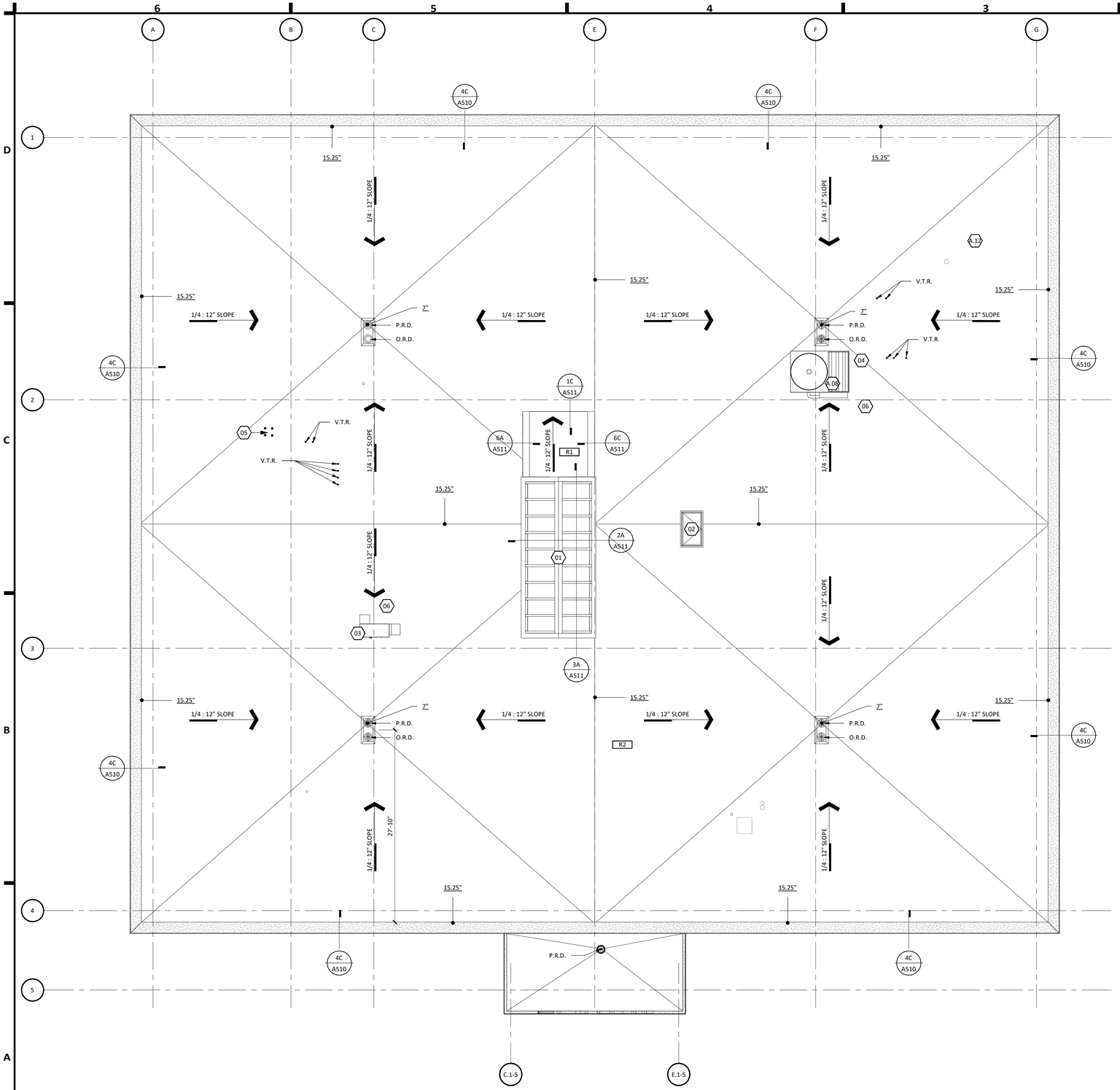

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION

ROOF PLAN KEYNOTES

KEYNOTE	DESCIRPTION
01	SKYLIGHT - SEE SPEC
02	EXISTING ROOF HATCH TO REMAIN
03	NEW ROOFTOP MECHANICAL UNIT - SEE MEP
04	BASE BID; EXISTING RELOCATED COOLING TOWER
05	CONDUIT FOR OWNER PROVIDED ROOFTOP MOUNTED RADIO ANTENNA. SEE ELEC
06	DRAINAGE CRICKET - SEE MECHANICAL DRAWINGS FOR EXACT SIZES, LOCATIONS, AND QUANTITIES. CRICKETS ARE TO BE PROVIDED AT ALL ROOFTOP MOUNTED EQUIPMENT AS REQUIRED FOR POSITIVE DRAINAGE
A.08	ALT #8 - REPLACE COOLING TOWER - SEE SPECS, A900 SERIES, MECH. DWG'S
A.12	ALT #12 - REPLACE ROOFING - SEE SPECS, A900 SERIES

ROOF PLAN GENERAL NOTES

A. COORDINATE FINAL SIZE AND FINAL LOCATION OF ALL EQUIPMENT SUPPORT WITH THE APPROPRIATE EQUIPMENT MANUFACTURER.
B. PROVIDE POSITIVE SLOPE TO ALL ROOF DRAINS. ROOF SLOPE TO BE 1/4" PER FOOT MINIMUM.
C. SEE DRAWINGS FOR ROOF DETAILS. ROOFING CONTRACTOR TO VERIFY ALL ROOF DETAILS COMPLY WITH APPROVED ROOFING SYSTEM. IT IS THE RESPONSIBILITY OF THE ROOFING CONTRACTOR TO SUPPLY ANY ADDITIONAL DETAILS AND/OR MATERIALS TO ENSURE COMPLIANCE WITH WARRANTY.
D. REFER TO MECHANICAL AND ELECTRICAL DOCUMENTS FOR ALL PIPES, CURBS, VENTS, DUCTS, CONDUITS, AND OTHER FEATURES EXTENDING THROUGH ROOF SURFACES WHICH REQUIRE FLASHING AND COORDINATE SIZE AND LOCATION OF SAME.
E. FOR ROOF ASSEMBLY TYPES SEE TYPICAL ASSEMBLIES SHEET(S).
F. INLET OF OVERFLOW ROOF SUMPS SHALL BE LOCATED 2" ABOVE ROOF SUMP INLET U.N.O.
G. SEE MECHANICAL DRAWINGS FOR FINAL QUANTITIES & FINAL LOCATIONS OF VENTS THRU ROOF.
H. PROVIDE SPLASH BLOCK AT ALL PRIMARY AND SECONDARY RAIN CONDUCTOR TERMINATIONS ONTO SINGLE-PLY MEMBRANE ROOFING

V.T.R. - PLUMBING VENT RHU ROOF. SEE MECH DRAWINGS FOR MORE INFORMATION
O.R.D. - NEW OVERFLOW ROOF DRAIN PROVIDED WITH ALTERNATE 12. SEE MECH DRAWINGS FOR MORE INFORMATION
P.R.D. - EXISTING PRIMARY ROOF DRAIN TO REMAIN - SEE MECHANICAL DRAWINGS FOR MORE INFORMATION

R1 — ROOF ASSEMBLY TAG - SEE TYPICAL ASSEMBLIES SHEET

XX" — SPOT ELEVATION: INDICATES APPROXIMATE THICKNESS OF ROOF INSULATION MEASURED FROM THE TOP OF ROOF DECK (INCLUDING THE THICKNESS OF THE EXISTING INSULATION TO REMAIN). ROOFING CONTRACTOR TO VERIFY ALL ELEVATIONS AND PROVIDE INSULATION AS REQUIRED TO MEET SPECIFIED R VALUES, PROVIDE POSITIVE DRAINAGE, AND AS REQUIRED TO MEET SPECIFIED ROOF WARRANTY.

6A / A204 ROOF PLAN
SCALE: 1/8" = 1'-0"

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MINOT, ND

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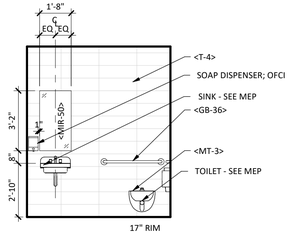
PROJECT 21019
SHEET A204
ROOF PLAN

11/4/2021 10:11:22 AM



6D.2 A210 TLT - NORTH ELEV.
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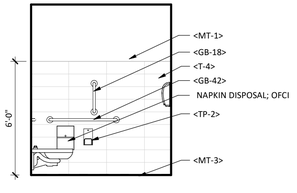

6D.1 A210 TLT - EAST ELEV. MIR.
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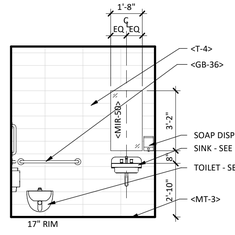
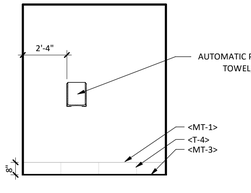
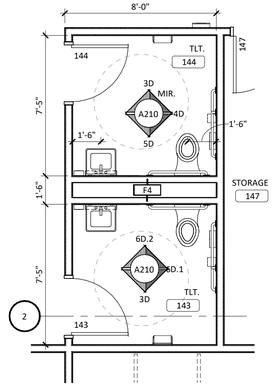


5D A210 TLT - SOUTH ELEV.
SCALE: 1/4" = 1'-0"

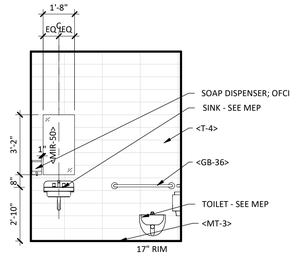
4D A210 TLT - EAST ELEV
SCALE: 1/4" = 1'-0"



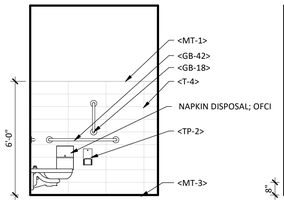
3D A210 TLT - PAPER TOWEL ELEV.
SCALE: 1/4" = 1'-0"



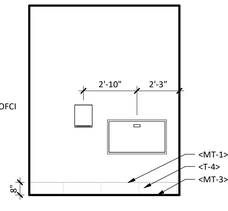
2D A210 1ST FLOOR TOILET ROOMS
SCALE: 1/4" = 1'-0"



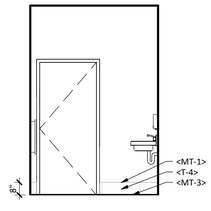
6C A210 FAMILY TLT - SOUTH
SCALE: 1/4" = 1'-0"



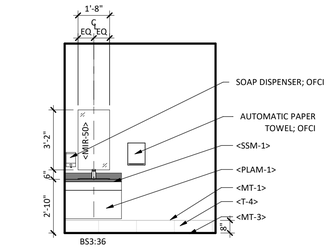
5C.2 A210 FAMILY TLT - WEST
SCALE: 1/4" = 1'-0"



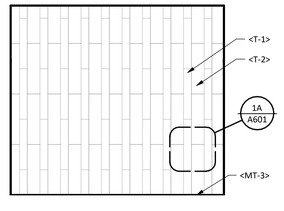
5C.1 A210 FAMILY TLT - NORTH
SCALE: 1/4" = 1'-0"



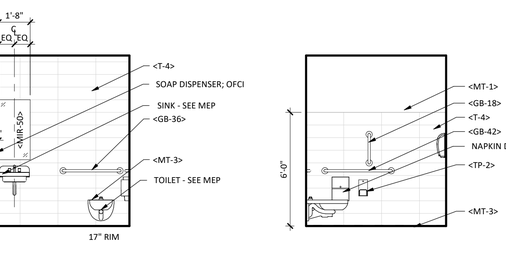
4C A210 FAMILY TLT - EAST
SCALE: 1/4" = 1'-0"



3C A210 MOTHERS - SOUTH ELEV.
SCALE: 1/4" = 1'-0"

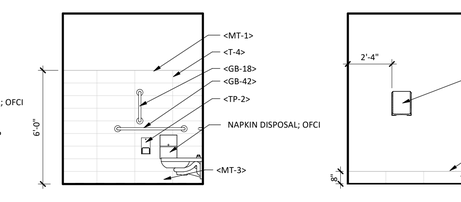


2C A210 2ND FLOOR R.R. HALLWAY - WEST
SCALE: 1/4" = 1'-0"

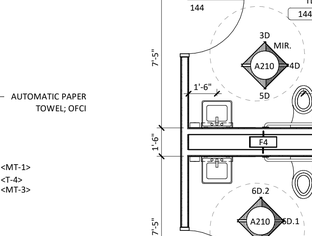


6B A210 2ND FLOOR MENS - NORTH ELEV.
SCALE: 1/4" = 1'-0"

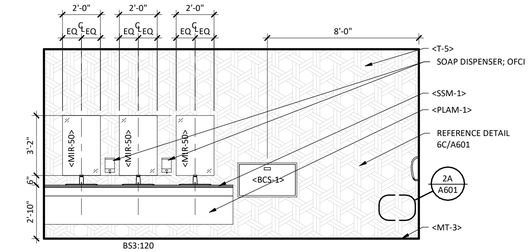
5B A210 2ND FLOOR MENS - EAST
SCALE: 1/4" = 1'-0"



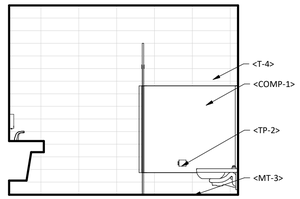
4B A210 2ND FLOOR MENS - SOUTH ELEV.
SCALE: 1/4" = 1'-0"



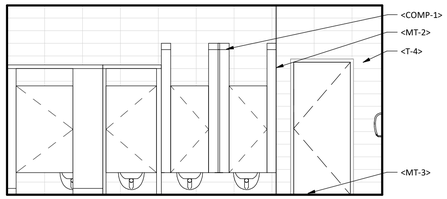
3B A210 2ND FLOOR MENS - WEST
SCALE: 1/4" = 1'-0"



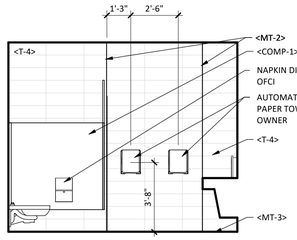
6A A210 2ND FLOOR WOMENS - SOUTH
SCALE: 1/4" = 1'-0"



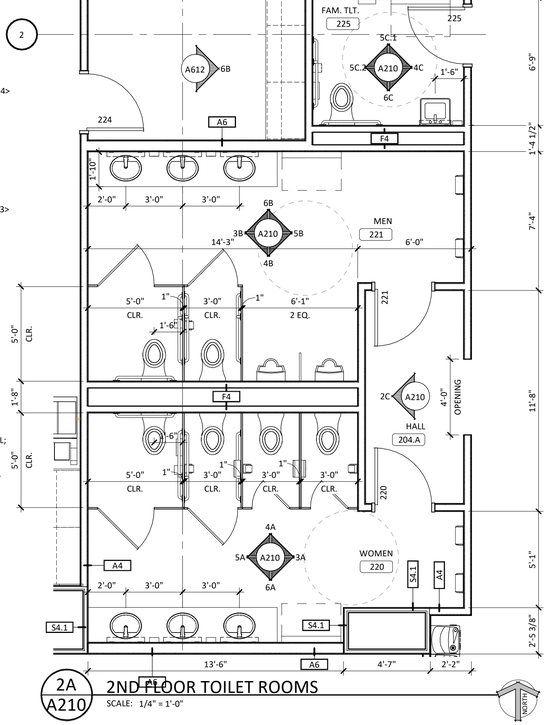
5A A210 2ND FLOOR WOMENS - WEST
SCALE: 1/4" = 1'-0"



4A A210 2ND FLOOR WOMENS - NORTH ELEV.
SCALE: 1/4" = 1'-0"



3A A210 2ND FLOOR WOMENS - EAST
SCALE: 1/4" = 1'-0"



2A A210 2ND FLOOR TOILET ROOMS
SCALE: 1/4" = 1'-0"

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION
BCS-1	10 2800 - BABY CHANGING STATION; POLYETHYLENE
COMP-1	10 2113.19 - PLASTIC TOILET COMPARTMENT
GB-18	10 2800 - GRAB BAR; 18 INCHES
GB-36	10 2800 - GRAB BAR; 36 INCHES
GB-42	10 2800 - GRAB BAR; 42 INCHES
MIR-50	10 2800 - MIRROR; FRAMELESS
MT-1	09 3000 - TILE TRIM
MT-2	09 3000 - TILE TRIM
MT-3	09 3000 - TILE TRIM
PLAM-1	06 4100 - PLASTIC LAMINATE FACED CASEWORK
SSM-1	12 3600 - SOLID SURFACE COUNTERTOP
T-1	09 3000 - TILE
T-2	09 3000 - TILE
T-4	09 3000 - TILE
T-5	09 3000 - TILE
TP-2	10 2800 - TOILET PAPER DISPENSER; DOUBLE ROLL

INT. ELEVATION GENERAL NOTES

A. REFER TO A621 FOR STANDARD CASEWORK ELEVATIONS AND CONSTRUCTION.
B. ALL WALL SURFACES TO BE <PT-1> UNLESS NOTED OTHERWISE.
C. PROVIDE LEVEL '5' DRYWALL FINISH AT ALL APPLIED GRAPHICS AND WRITABLE WALL SURFACE LOCATIONS.
D. PROVIDE WALL REINFORCEMENT AT ALL WALL MOUNTED ITEMS.
E. ANY EXPOSED CABINET EDGE SHALL BE FINISHED EDGE TO MATCH ADJACENT CABINET FINISH.
F. SEE SHEET G120 FOR ALL TOILET RIM HEIGHTS AND ACCESSORY MOUNTING HEIGHTS.

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
DATE 11 04 2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A210
ENLARGED PLANS AND ELEVATIONS

11/4/2021 10:11:34 AM

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION
LAM GL-1	08 8000 - 2 LAYERS OF 1/8" GLASS WITH 0.060 PVB LAYER
PLAM-1	06 4100 - PLASTIC LAMINATE FACED CASEWORK
PLAM-2	06 4100 - PLASTIC LAMINATE FACED CASEWORK
PLAM-3	06 4100 - PLASTIC LAMINATE FACED CASEWORK
SSM-1	12 3600 - SOLID SURFACE COUNTERTOP
WD PNL-1	09 5100 - WOOD WALL PANEL

INT. ELEVATION GENERAL NOTES

A. REFER TO A621 FOR STANDARD CASEWORK ELEVATIONS AND CONSTRUCTION.
B. ALL WALL SURFACES TO BE <PT-1> UNLESS NOTED OTHERWISE.
C. PROVIDE LEVEL '5' DRYWALL FINISH AT ALL APPLIED GRAPHICS AND WRITABLE WALL SURFACE LOCATIONS.
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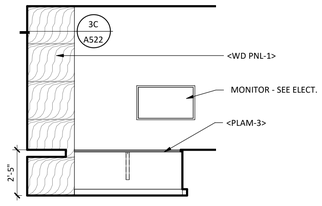
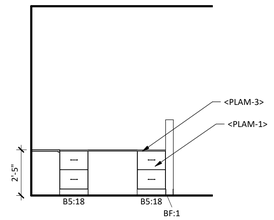
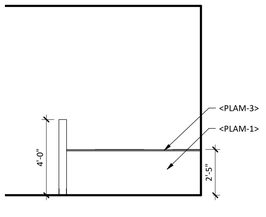
F. SEE SHEET G120 FOR ALL TOILET RIM HEIGHTS AND ACCESSORY MOUNTING HEIGHTS.



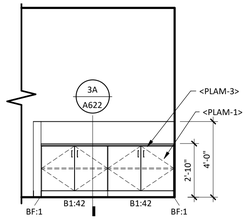
5D A211 ASSESSOR SERVICE DESK - NORTH
SCALE: 1/4" = 1'-0"



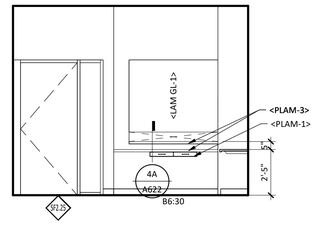
4D A211 ASSESSOR SERVICE DESK - EAST
SCALE: 1/4" = 1'-0"



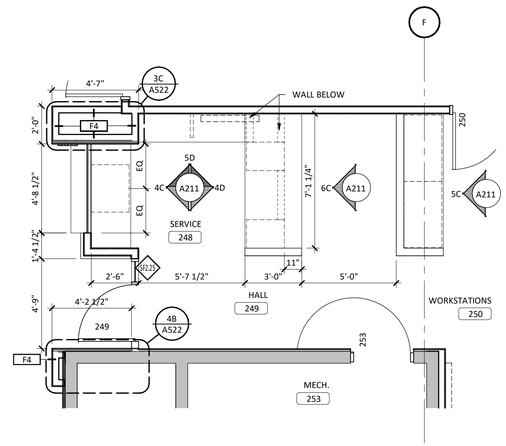
6C A211 ASSESSOR BACK DESK - WEST
SCALE: 1/4" = 1'-0"



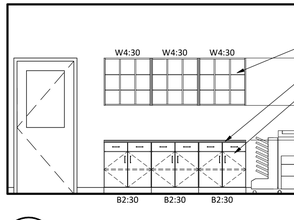
5C A211 ASSESSOR STORAGE CABINETS
SCALE: 1/4" = 1'-0"



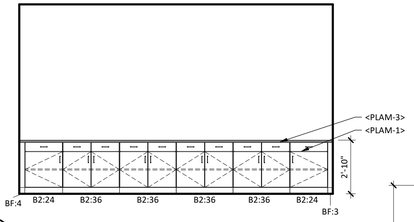
4C A211 ASSESSOR SERVICE DESK - WEST
SCALE: 1/4" = 1'-0"



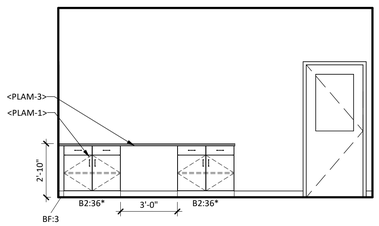
2C A211 2ND FLOOR ASSESSOR SERVICE DESK
SCALE: 1/4" = 1'-0"



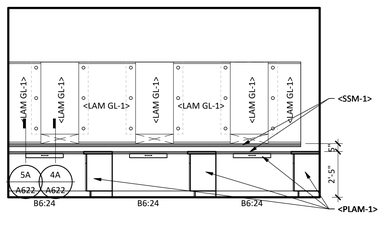
4B A211 MAILROOM - EAST
SCALE: 1/4" = 1'-0"



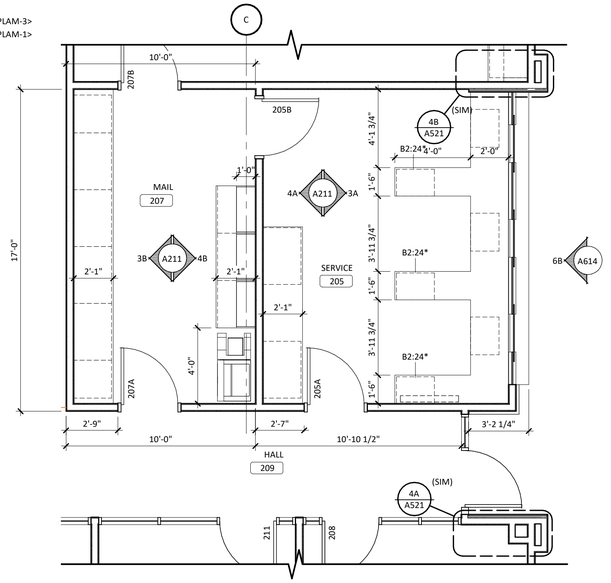
3B A211 MAILROOM - WEST
SCALE: 1/4" = 1'-0"



4A A211 UTILITY BILLING SERVICE DESK - WEST
SCALE: 1/4" = 1'-0"



3A A211 UTILITY BILLING SERVICE DESK - EAST
SCALE: 1/4" = 1'-0"



2A A211 2ND FLOOR SERVICE DESK, MAIL ROOM
SCALE: 1/4" = 1'-0"

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JENNIFER BURKE JACKSON
DATE 11 04 2021
STATE OF NORTH DAKOTA

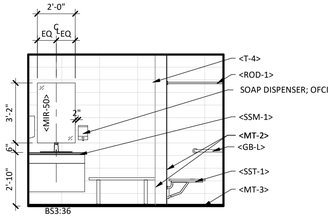
REVISION SCHEDULE

NO.	DESCRIPTION	DATE

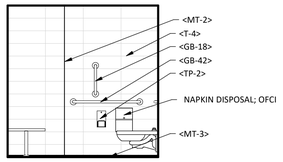
CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE
11/04/21
PHASE
CONSTRUCTION DOCUMENTS
PROJECT
21019
SHEET
A211
ENLARGED PLANS AND ELEVATIONS

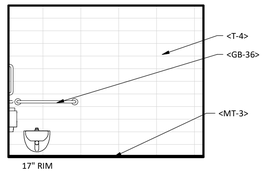
11/4/2021 10:11:41 AM



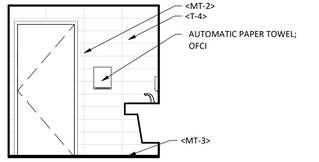
6D A212 SHOWER/TLT - SOUTH ELEV.
SCALE: 1/4" = 1'-0"



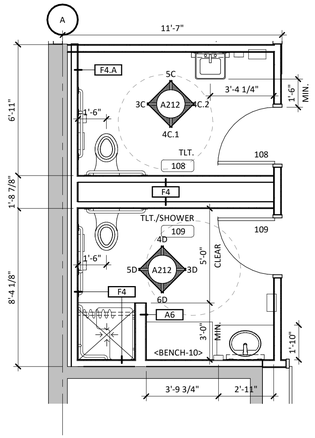
5D A212 SHOWER/TLT - WEST ELEV.
SCALE: 1/4" = 1'-0"



4D A212 SHOWER/TLT - NORTH ELEV.
SCALE: 1/4" = 1'-0"



3D A212 SHOWER/TLT - EAST ELEV.
SCALE: 1/4" = 1'-0"



INT. ELEVATION GENERAL NOTES

A. REFER TO A621 FOR STANDARD CASEWORK ELEVATIONS AND CONSTRUCTION.
B. ALL WALL SURFACES TO BE <PT-1> UNLESS NOTED OTHERWISE.
C. PROVIDE LEVEL '5' DRYWALL FINISH AT ALL APPLIED GRAPHICS AND WRITABLE WALL SURFACE LOCATIONS.
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E. ANY EXPOSED CABINET EDGE SHALL BE FINISHED EDGE TO MATCH ADJACENT CABINET FINISH.
F. SEE SHEET G120 FOR ALL TOILET RIM HEIGHTS AND ACCESSORY MOUNTING HEIGHTS.

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION
BCS-1	10 2800 - BABY CHANGING STATION; POLYETHYLENE
BENCH-10	10 5113 - LOCKER ROOM BENCH
COMP-1	10 2113.19 - PLASTIC TOILET COMPARTMENT
GB-18	10 2800 - GRAB BAR; 18 INCHES
GB-36	10 2800 - GRAB BAR; 36 INCHES
GB-42	10 2800 - GRAB BAR; 42 INCHES
GB-L	10 2800 - GRAB BAR; L-SHAPED
MIR-50	10 2800 - MIRROR; FRAMELESS
MT-2	09 3000 - TILE TRIM
MT-3	09 3000 - TILE TRIM
PLAM-1	06 4100 - PLASTIC LAMINATE FACED CASEWORK
ROD-1	10 2800 - CURTAIN ROD; STRAIGHT
SSM-1	12 3600 - SOLID SURFACE COUNTERTOP
SST-1	10 2800 - SHOWER SEAT
T-1	09 3000 - TILE
T-2	09 3000 - TILE
T-4	09 3000 - TILE
T-5	09 3000 - TILE
TP-2	10 2800 - TOILET PAPER DISPENSER; DOUBLE ROLL

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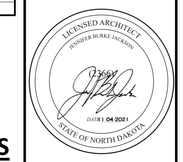
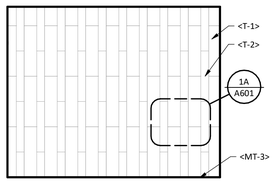
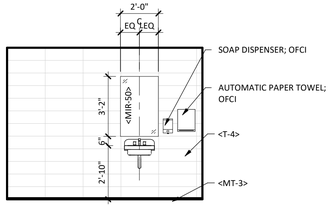


REVISION SCHEDULE

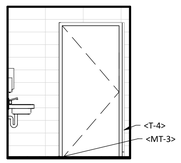
NO.	DESCRIPTION	DATE



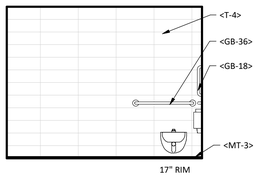
6C A212 RESTROOM HALLWAY - WEST ELEV.
SCALE: 1/4" = 1'-0"



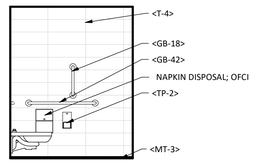
5C A212 PSAP TLT - NORTH ELEV.
SCALE: 1/4" = 1'-0"



4C.2 A212 PSAP TLT - EAST ELEV.
SCALE: 1/4" = 1'-0"

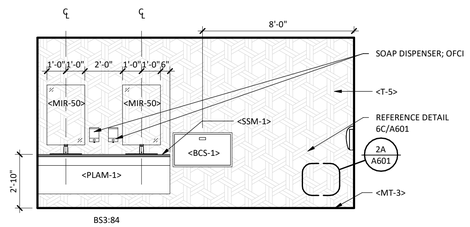


4C.1 A212 PSAP TLT - SOUTH ELEV.
SCALE: 1/4" = 1'-0"

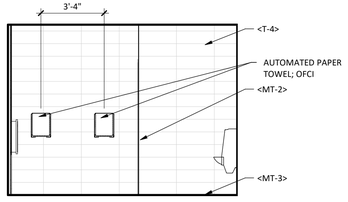


3C A212 PSAP TLT- WEST ELEV.
SCALE: 1/4" = 1'-0"

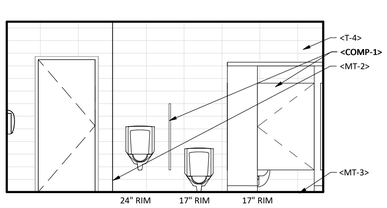
2C A212 PSAP TOILET ROOMS
SCALE: 1/4" = 1'-0"



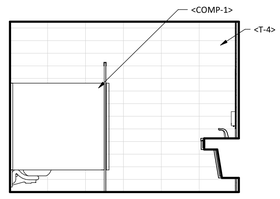
6B A212 3RD FLOOR MENS - NORTH ELEV.
SCALE: 1/4" = 1'-0"



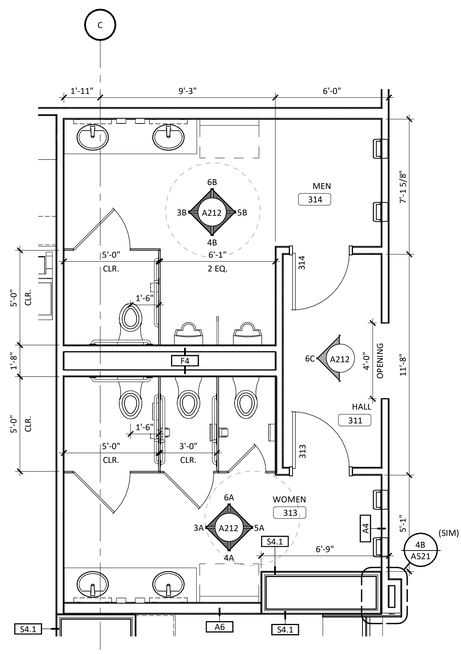
5B A212 3RD FLOOR MENS - EAST
SCALE: 1/4" = 1'-0"



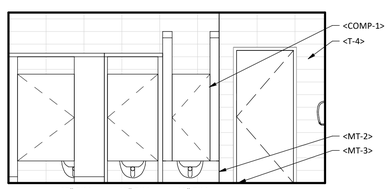
4B A212 3RD FLOOR MENS - SOUTH ELEV.
SCALE: 1/4" = 1'-0"



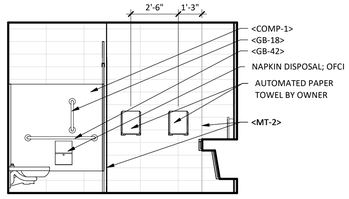
3B A212 3RD FLOOR MENS - WEST
SCALE: 1/4" = 1'-0"



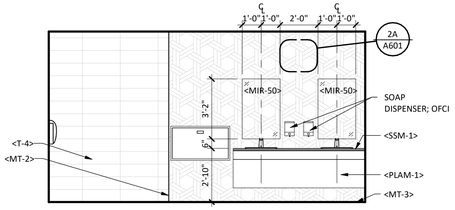
2A A212 3RD FLOOR TOILET ROOMS
SCALE: 1/4" = 1'-0"



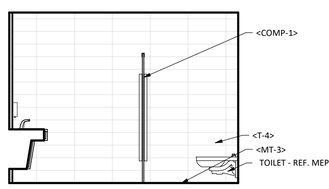
6A A212 3RD FLOOR WOMENS - NORTH
SCALE: 1/4" = 1'-0"



5A A212 3RD FLOOR WOMENS - EAST
SCALE: 1/4" = 1'-0"



4A A212 3RD FLOOR WOMENS - SOUTH ELEV.
SCALE: 1/4" = 1'-0"



3A A212 3RD FLOOR WOMENS - WEST
SCALE: 1/4" = 1'-0"

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE
11/04/21
PHASE
CONSTRUCTION DOCUMENTS
PROJECT
21019
SHEET
A212
ENLARGED PLANS AND ELEVATIONS

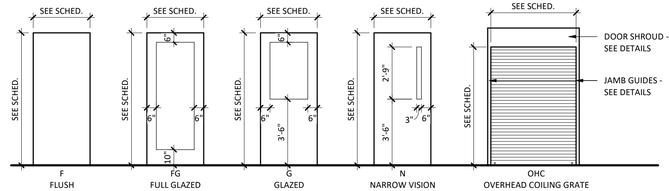
11/4/2021 10:11:51 AM

DOOR SCHEDULE

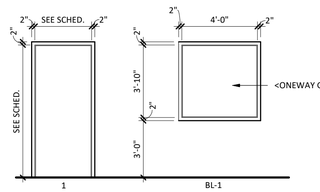
DOOR NUMBER	HW SET	RATING	ROOM NAME	SIZE		DOORS			FRAME			DETAIL			NOTES	
				WIDTH	HEIGHT	MAT'L	DOOR TYPE	GLZ	FRAME TYPE	MAT'L	GLZ	JAMB	HEAD	SILL	COMMENTS	REVISION
FIRST FLOOR																
100A	368.0		VESTIBULE	6' - 2"	7' - 0"	ALUM	FG-FG	INSUL TEMP GL-1	SF1.2	ALUM	INSUL TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.		
100B	269.0		VESTIBULE	6' - 0"	7' - 0"	ALUM	FG-FG	TEMP GL-1	SF2.1	ALUM	--	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.		
117	1.0		DECOMPRESS	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
119	1.1		BREAKROOM	3' - 0"	7' - 0"	WD	F	--	SF2.6	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.		
122	18.3	45 MIN	HALL	3' - 0"	7' - 0"	WD	F	--	1	HM	--	5A/A221	3A/A221	--		
124	38.0		STAIR	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	A	
125	33.1		CUST.	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
126	4.0		JAN.	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
127A	34.1		CUST.	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
128A	38.0		HALL	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
128B	38.0		LOBBY	3' - 4"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
131	14.2	45 MIN	STAIR	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
132	18.0		MEETING	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
133	18.4		SERVER	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	GAS AGENT FIRE SUPPRESSION - SEE MECH	
134	5.0		OFFICE	3' - 0"	7' - 0"	WD	F	--	SF2.4	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
135	5.0		OFFICE	3' - 0"	7' - 0"	WD	F	--	SF2.4	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
136	5.0		OFFICE	3' - 0"	7' - 0"	WD	F	--	SF2.4	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
137	5.0		OFFICE	3' - 0"	7' - 0"	WD	F	--	SF2.5	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
138	5.0		OFFICE	3' - 0"	7' - 0"	WD	F	--	SF2.5	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
139	5.0		OFFICE	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	D	
141	5.0		OFFICE	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	D	
142A	5.0		STOR.	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
142B	5.0		STOR.	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
143	12.0		TLT.	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	D	
144	12.0		TLT.	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	D	
145	38.1		STAIR	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	A	
146	4.1		JANITOR	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
147	4.2		STORAGE	6' - 0"	7' - 0"	WD	F-F	--	1	HM	--	3B/A221	2B/A221	--		
148	18.0		TENANT	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
149	18.0		SERVER	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
151	3.0		STORAGE	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
152	5.0		OFFICE	3' - 0"	7' - 0"	WD	F	--	SF2.2	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
153	5.0		OFFICE	3' - 0"	7' - 0"	WD	F	--	SF2.3	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
154	5.0		OFFICE	3' - 0"	7' - 0"	WD	F	--	SF2.3	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
ACCESS FLOOR																
103	18.4		RADIO ROOM	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	GAS AGENT FIRE SUPPRESSION - SEE MECH	
104	218.1		DISPATCH CONSOLES	3' - 0"	7' - 0"	WD	F	--	SF2.7	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.		
106	1.0		CONFERENCE ROOM	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
115	5.0		ASSIST. PSAP MANAGER	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	D	
116	4.0		STORAGE	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
121	5.0		PSAP MANAGER	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	D	
ALLEY ENTRANCE																
107A	348.0		VESTIBULE	6' - 0"	7' - 0"	HM	F-F	--	1	HM	--	--	--	--	VFY W/EXIST. OPENING - A	
107B	248.0		VESTIBULE	6' - 0"	7' - 0"	HM	F-F	--	1	HM	--	3B/A221	2B/A221	--		
108	12.0		TLT.	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	D	
109	12.0		TLT./SHOWER	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	D	
112	18.1		ELECT.	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
127B	124.0		BOILER	5' - 0"	6' - 4"	HM	F-F	--	1	HM	--	--	--	--	ACTIVE/INACTIVE LEAF, VFY W/EXIST. OPENING - A	
SECOND FLOOR																
200A	368.0		VEST.	6' - 4"	7' - 0"	ALUM	FG-FG	INSUL TEMP GL-1	SF1.5	ALUM	INSUL TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.		
200B	269.0		LOBBY	6' - 0"	7' - 0"	ALUM	FG-FG	TEMP GL-1	SF2.12	ALUM	--	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.		
201	--		LOBBY	9' - 0"	13' - 4"	STL	OHC		JM	STL		5A, 6A/A520	5C/A225		OH COILING GRILLE; KEY OPERATED - B	
205A	1.1		SERVICE	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
205B	1.0		SERVICE	3' - 0"	7' - 0"	WD	G		1	HM		3B/A221	2B/A221			
206	18.0		A/P	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
207A	1.1		MAIL	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
207B	18.1		MAIL	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
208	5.0		A/R	3' - 0"	7' - 0"	WD	F	--	SF2.11	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
209	18.0		LOBBY	3' - 0"	7' - 0"	WD	F	--	SF2.22	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.		
211	5.0		SR. ACT.	3' - 0"	7' - 0"	WD	F	--	SF2.11	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
212	5.0		TREASURER	3' - 0"	7' - 0"	WD	F	--	SF2.11	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
213	5.0		FINANCE DIRECTOR	3' - 0"	7' - 0"	WD	F	--	SF2.10	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
214	5.0		COMPTROLLER	3' - 0"	7' - 0"	WD	F	--	SF2.10	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
216	5.0		SR. ACT.	3' - 0"	7' - 0"	WD	F	--	SF2.10	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
217	5.0		SR. ACT.	3' - 0"	7' - 0"	WD	F	--	SF2.10	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
218	5.0		SR. ACT.	3' - 0"	7' - 0"	WD	F	--	SF2.10	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
220	19.0		WOMEN	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
221	19.0		MEN	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
223	18.1		STORAGE	3' - 1"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	VFY W/EXIST. OPENING - A	
224	5.0		STORAGE	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
225	12.0		FAM. TLT.	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	D	
226	12.0		MOTHERS	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	D	
227	14.0		JAN.	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
228	18.0		HALL	3' - 0"	7' - 0"	WD	F	--	SF2.19	ALUM	TEMP GL-1					
231	5.0		BUSINESS ANALYST	3' - 0"	7' - 0"	WD	F	--	SF2.8	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
232	5.0		AUDITOR	3' - 0"	7' - 0"	WD	F	--	SF2.8	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
233	5.0		NDR GRANT MANAGER	3' - 0"	7' - 0"	WD	F	--	SF2.9	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
234	5.0		NDR COORDINATOR	3' - 0"	7' - 0"	WD	F	--	SF2.9	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
235A	18.1		LARGE MEETING	3' - 0"	7' - 0"	WD	F	--	SF2.18	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.		
235B	5.0		LARGE MEETING	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
236	4.1		JANITOR	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
237	15.0		MAYOR	3' - 0"	7' - 0"	WD	F	--	SF2.17	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
238	18.1		P.I.O.	3' - 0"	7' - 0"	WD	F	--	SF2.17	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
241	3.0		P.I.O. BROADCAST	3' - 0"	7' - 0"	WD	G	--	1	HM	--				D	
242A	18.0		COUNCIL CONFERENCE	3' - 0"	7' - 0"	WD	F	--	SF2.16	ALUM	TEMP GL-1					
242B	18.0		COUNCIL CHAMBERS	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	C	
243	4.0		STORAGE	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	C	
244A	15.0		OFFICE/ INTERVIEW	3' - 0"	7' - 0"	WD	F	--	SF2.15	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
244B	18.0		OFFICE/ INTERVIEW	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	C, D	
245	15.0		OFFICE	3' - 0"	7' - 0"	WD	F	--	SF2.15	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
246A	38.1		COUNCIL CHAMBERS	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
246B	38.1		COUNCIL CHAMBERS	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
247	18.1		A/V	3' - 0"	7' - 0"	WD	F	--	1	HM	ONEWAY GL-1	3B/A221	2B/A221	--	C, D	
249	18.0		LOBBY	3' - 0"	7' - 0"	WD	F	--	SF2.25	ALUM	TEMP GL-1					
250	18.1		WORKSTATIONS	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	C	
251	5.0		ASSESSOR	3' - 0"	7' - 0"	WD	F	--	SF2.14	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
252	5.0		ASSIST. ASSESSOR	3' - 0"	7' - 0"	WD	F	--	SF2.14	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
253	14.3	45 MIN	MECH.	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
254	38.1		LOBBY	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	A	
256	31.1		STAIR	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	A	

DOOR SCHEDULE

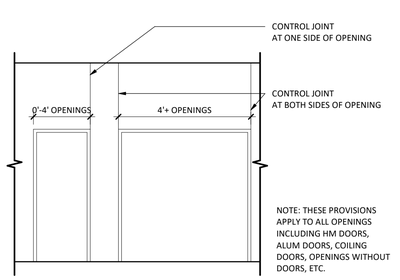
DOOR NUMBER	HW SET	RATING	ROOM NAME	SIZE		DOORS			FRAME			DETAIL			NOTES	
				WIDTH	HEIGHT	MAT'L	DOOR TYPE	GLZ	FRAME TYPE	MAT'L	GLZ	JAMB	HEAD	SILL	COMMENTS	REVISION
THIRD FLOOR																
300	--		STAIR	9' - 0"	8' - 10"	STL	OHC		JM	STL		5A, 6A/A520	5C/A225		OH COILING GRILLE; KEY OPERATED - B	
304	5.0		SECRETARY	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	D	
305A	18.1		LARGE MEETING ROOM	3' - 0"	7' - 0"	WD	F	--	SF2.33	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.		
305B	5.0		LARGE MEETING ROOM	3' - 0"	7' - 0"	WD	F	--	SF2.26	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.		
306	18.1		WAITING	3' - 0"	7' - 0"	WD	F	--	SF2.34	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.		
307A	5.0		CITY MANAGER	3' - 0"	7' - 0"	WD	F	--	SF2.26	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
307B	5.0		LARGE MEETING ROOM	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
309	5.0		CLERK	3' - 0"	7' - 0"	WD	F	--	SF2.27	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
310	5.0		FLEX	3' - 0"	7' - 0"	WD	F	--	SF2.27	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
312A	1.1		PRINT./FILE	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
312B	1.0		PRINT./FILE	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
313	19.0		WOMEN	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
314	19.0		MEN	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
315	18.1		COMPUTER TRAINING	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
317	5.0		ASSIST. CITY MGR.	3' - 0"	7' - 0"	WD	F	--	SF2.27	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
318	5.0		CONTRACT ATTORNEY	3' - 0"	7' - 0"	WD	F	--	SF2.27	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
319	5.0		ASSIST. CITY ATTORNEY	3' - 0"	7' - 0"	WD	F	--	SF2.27	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
321	5.0		CITY ATTORNEY	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	D	
323	18.0		WAITING	3' - 0"	7' - 0"	WD	F	--	SF2.24	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.		
324A	18.0		MEDIUM MEETING	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
324B	5.0		MEDIUM MEETING	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
325	15.0		SMALL MEETING	3' - 0"	7' - 0"	WD	F	--	SF2.23	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.		
327A	33.0		LUNCH ROOM	3' - 0"	7' - 0"	WD	F	--	SF2.28	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.		
327B	33.1		LUNCH ROOM	3' - 0"	7' - 0"	WD	F	--	SF2.29	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.		
328	12.0		MOTHERS	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	D	
329	18.0		WAITING	3' - 0"	7' - 0"	WD	F	--	SF2.21	ALUM	TEMP GL-1			--		
330	5.0		STORAGE	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
331	1.0		CONFERENCE	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
332	5.0		OFFICE	3' - 0"	7' - 0"	WD	F	--	SF2.30	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
333	5.0		OFFICE	3' - 0"	7' - 0"	WD	F	--	SF2.31	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
334	5.0		OFFICE	3' - 0"	7' - 0"	WD	F	--	SF2.32	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
335	5.0		OFFICE	3' - 0"	7' - 0"	WD	F	--	SF2.32	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
336	5.0		OFFICE	3' - 0"	7' - 0"	WD	F	--	SF2.32	ALUM	TEMP GL-1	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	SEE GLZ. ELEVA.	D	
337	14.0		MECH.	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	A	
339	18.0		CORRIDOR	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
347	14.3	45 MIN	MECH.	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
353	4.1		JAN.	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--		
368	31.0		STAIR	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	A	
369	38.0		STAIR	3' - 0"	7' - 0"	WD	F	--	1	HM	--	3B/A221	2B/A221	--	A	

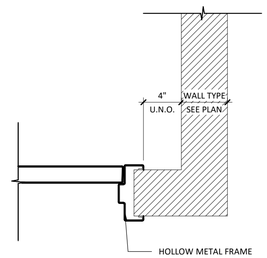


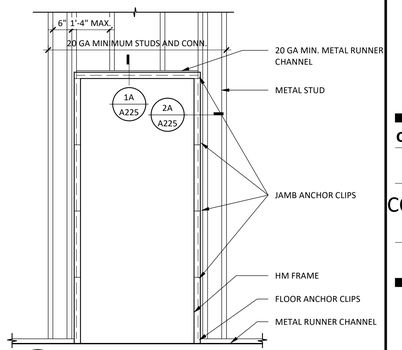
DOOR TYPES



HOLLOW METAL FRAME TYPES







DOOR SCHEDULE KEYNOTES

A. NEW DOOR IN EXISTING OPENING - FIELD VERIFY
B. MOTORIZED OVERHEAD COILING GRATE (OHC) WITH STEEL JAMB RAILS (JM). SEE SPEC. INDICATED DOOR HEIGHT IS THE OPENING HEIGHT. ACTUAL DOOR HEIGHTS MAY VARY BASED ON COILING DOOR SHROUD MOUNTING LOCATION. SEE HEAD DETAILS FOR MORE INFORMATION.
C. COUNCIL CHAMBERS SIDE OF HOLLOW METAL DOOR AND FRAME TO BE <PT-15>. OTHER SIDE TO BE TYPICAL <PT-14>.
D. INCLUDE COAT HOOK <HK-1> AT ALL OFFICE DOORS; LOCATE ON INTERIOR SIDE, SEE MOUNTING HEIGHTS SHEET(S) FOR STANDARD LOCATION.

DOOR SCHEDULE GENERAL NOTES

1. INTERIOR HM DOOR FRAMES TO BE PAINTED "PT-14" U.N.O.
2. INTERIOR HM DOORS TO BE PAINTED "PT-14" U.N.O.
3. EXTERIOR HM DOORS AND FRAMES TO BE PAINTED "PT-14" U.N.O.
4. ALL EXTERIOR HM DOORS AND FRAMES TO BE INSULATED
5. WOOD DOORS ARE PREFINISHED - SEE SPEC
6. ALUMINUM DOORS AND FRAMES ARE PREFINISHED - SEE SPEC

3A/A220 TYP. CONTROL JOINT LOCATIONS
SCALE: 1/4" = 1'-0"

2A/A220 TYP DOOR LOCATION PLAN
SCALE: 1 1/2" = 1'-0"

1A/A220 DOOR FRAMING ELEVATION
SCALE: 1/2" = 1'-0"

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
DATE 1.04.2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A220
DOOR SCHEDULE

11/4/2021 10:11:55 AM

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION
ALSTOR-1	08 4313 - ALUMINUM-FRAMED STOREFRONTS
ALSTOR-2	08 4313 - ALUMINUM-FRAMED STOREFRONTS
COMP PNL-20	07 4243 - PHENOLIC RESIN COMPOSITE WALL PANELS
COMP PNL-21	07 4243 - PHENOLIC RESIN COMPOSITE WALL PANELS
MET STUD-2	09 2116 - NON-LOADBEARING METAL STUDS, 20 GA
SEALANT-1	07 9200 - JOINT SEALANT OR CAULKING WITH OR WITHOUT BACKER ROD
WD BLKG	06 1000 - WOOD BLOCKING
WD PNL-1	09 5100 - WOOD WALL PANEL
WD SHTG-30F	06 1000 - 1/2" SHEATHING, FIRE RETARDANT TREATED

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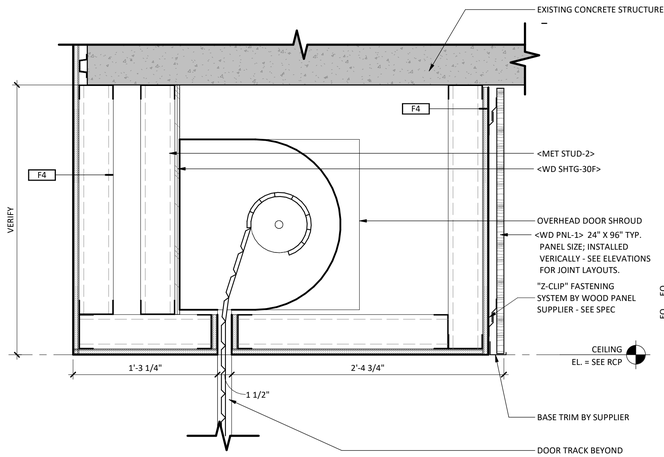
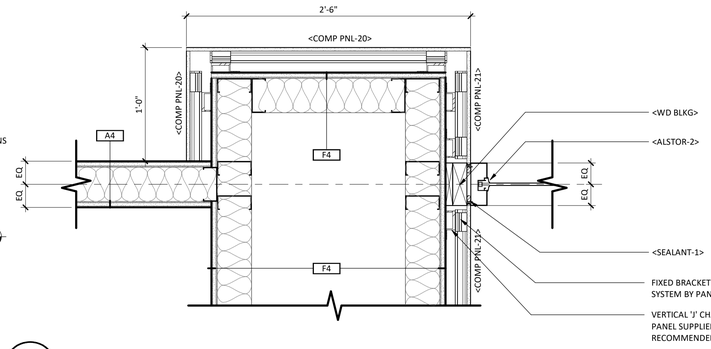


5C A225 OH DOOR HEAD
SCALE: 1 1/2" = 1'-0"



3C A225 SF2.12 JAMB - ALTERNATE
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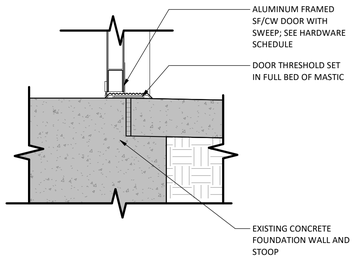
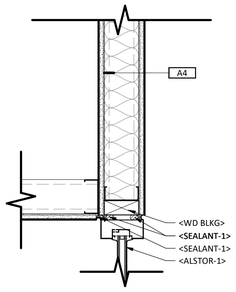
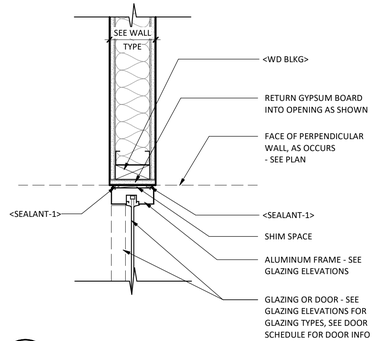


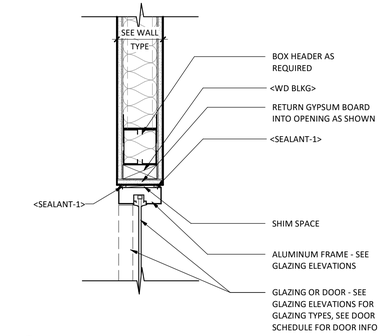
1C A225 SF SILL AT EXISTING STOOP
SCALE: 1 1/2" = 1'-0"



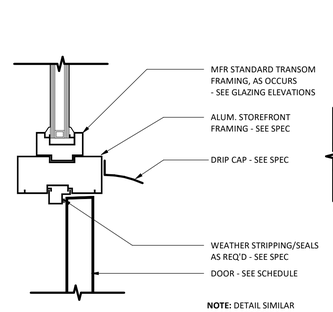
5B A225 HEAD DETAIL
SCALE: 1 1/2" = 1'-0"



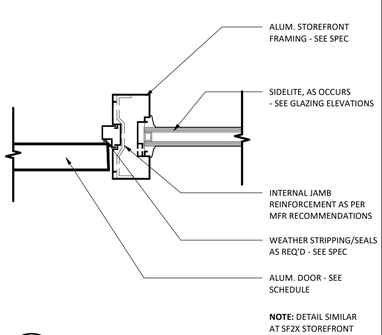
4B A225 SF2.X JAMB AT GYP. BD. WALL
SCALE: 1 1/2" = 1'-0"



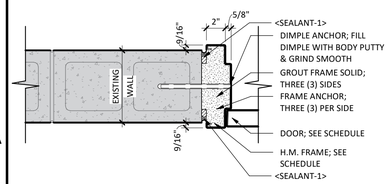
3B A225 SF2.X HEAD AT GYP. BD. WALL
SCALE: 1 1/2" = 1'-0"



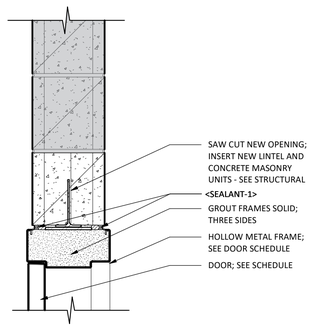
2B A225 SF1.X DOOR HEAD
SCALE: 3" = 1'-0"



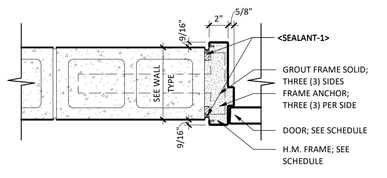
1B A225 SF1.X DOOR JAMB
SCALE: 3" = 1'-0"



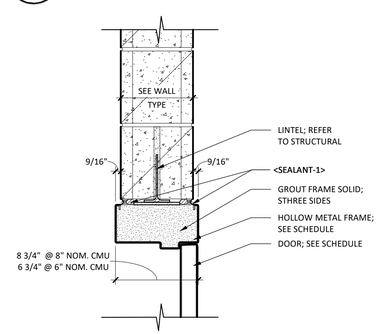
6A A225 H.M. JAMB @ EXISTING CMU
SCALE: 1 1/2" = 1'-0"



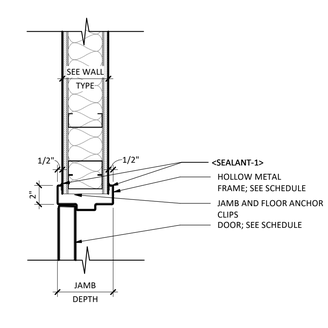
5A A225 H.M. HEAD @ EXISTING CMU
SCALE: 1 1/2" = 1'-0"



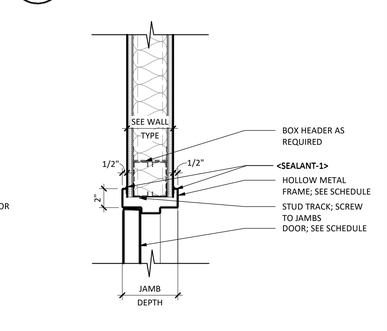
4A A225 H.M. JAMB @ MASONRY
SCALE: 1 1/2" = 1'-0"



3A A225 H.M. HEAD @ MASONRY
SCALE: 1 1/2" = 1'-0"



2A A225 H.M JAMB @ GYPSUM BOARD
SCALE: 1 1/2" = 1'-0"



1A A225 H.M HEAD @ GYPSUM BOARD
SCALE: 1 1/2" = 1'-0"

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE
11/04/21
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CONSTRUCTION DOCUMENTS
PROJECT
21019
SHEET
A225
DOOR DETAILS

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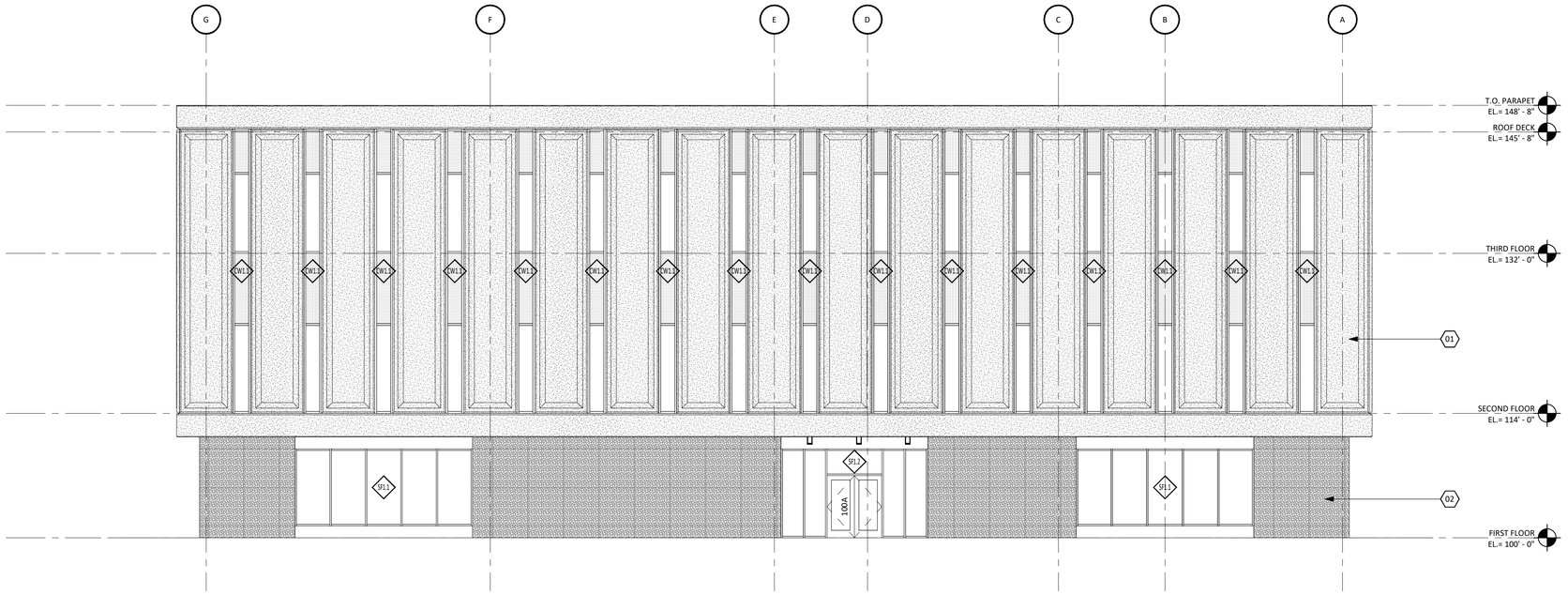
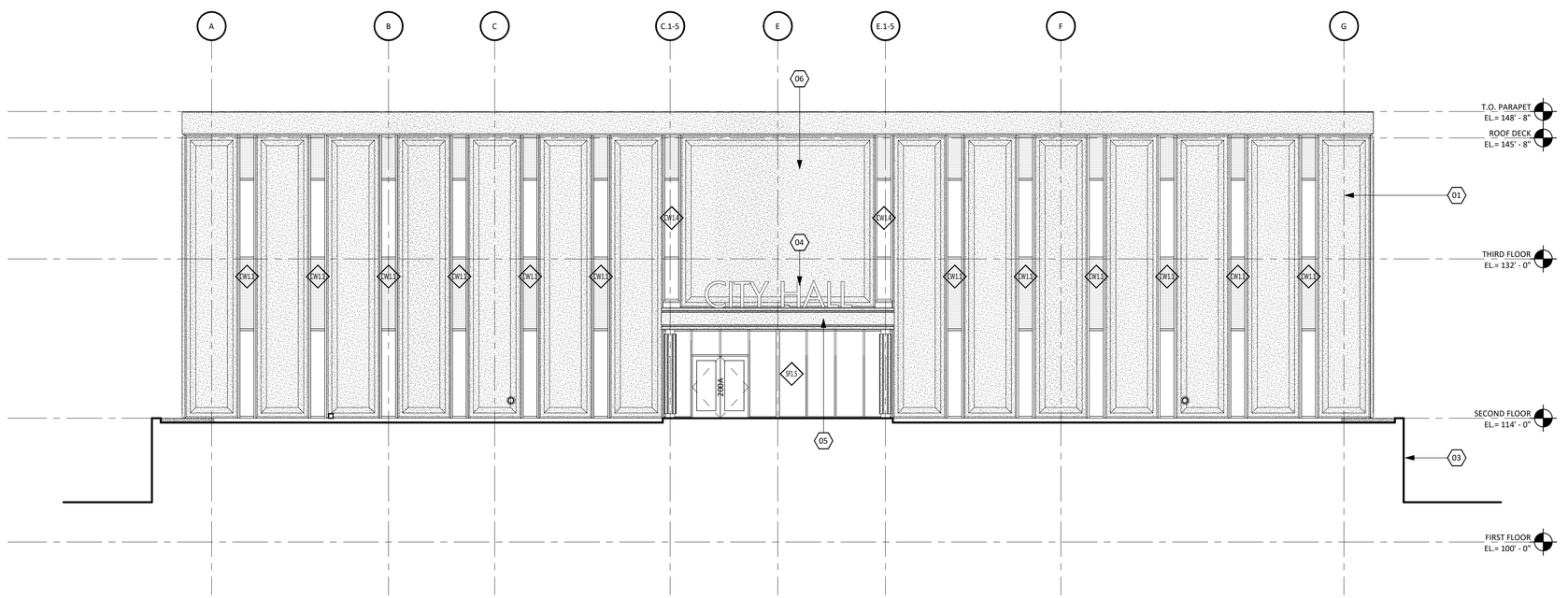


6C
A301

EXTERIOR ELEVATION - NORTH

SCALE: 1/8" = 1'-0"



6A
A301

EXTERIOR ELEVATION - SOUTH

SCALE: 1/8" = 1'-0"

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION

EXT. ELEVATIONS KEYNOTE

KEYNOTE	DESCRIPTION
01	EXISTING PRECAST CONCRETE PANELS TO REMAIN; TYP.
02	EXISTING CAST IN PLACE CONCRETE WALLS TO REMAIN EXISTING CAST IN PLACE CONCRETE WALLS TO REMAIN; TYP.
03	EXISTING CAST IN PLACE CONCRETE RETAINING WALLS TO REMAIN; TYP.
04	CANOPY MOUNTED EXTERIOR LIT SIGNAGE - SEE SIGNAGE PLAN
05	BASE BID: EXISTING CANOPY IS TO REMAIN. SEE ALTERNATE 3 FOR ENTRANCE CANOPY IMPROVEMENTS.
06	BASE BID: EXISTING PRECAST CONCRETE PANELS TO REMAIN - SEE ALTERNATE 4 FOR EXPANDED GLAZING AT THIS LOCATION.
07	NEW SKYLIGHT - SEE ROOF PLAN
08	EXISTING MECHANICAL LOUVER TO REMAIN.

EXT. ELEVATION GENERAL NOTES

A. BASE BID: ALL EXISTING EXTERIOR STOREFRONT AND CURTAINWALL IS TO REMAIN
B. ALTERNATE 2: REPLACE ALL EXISTING EXTERIOR STOERFRONT AND CURTAINWALL. REFER TO GLAZING ELEVATIONS

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REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466

DATE
11/04/21

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CONSTRUCTION DOCUMENTS

PROJECT
21019

SHEET
A301
EXTERIOR ELEVATIONS

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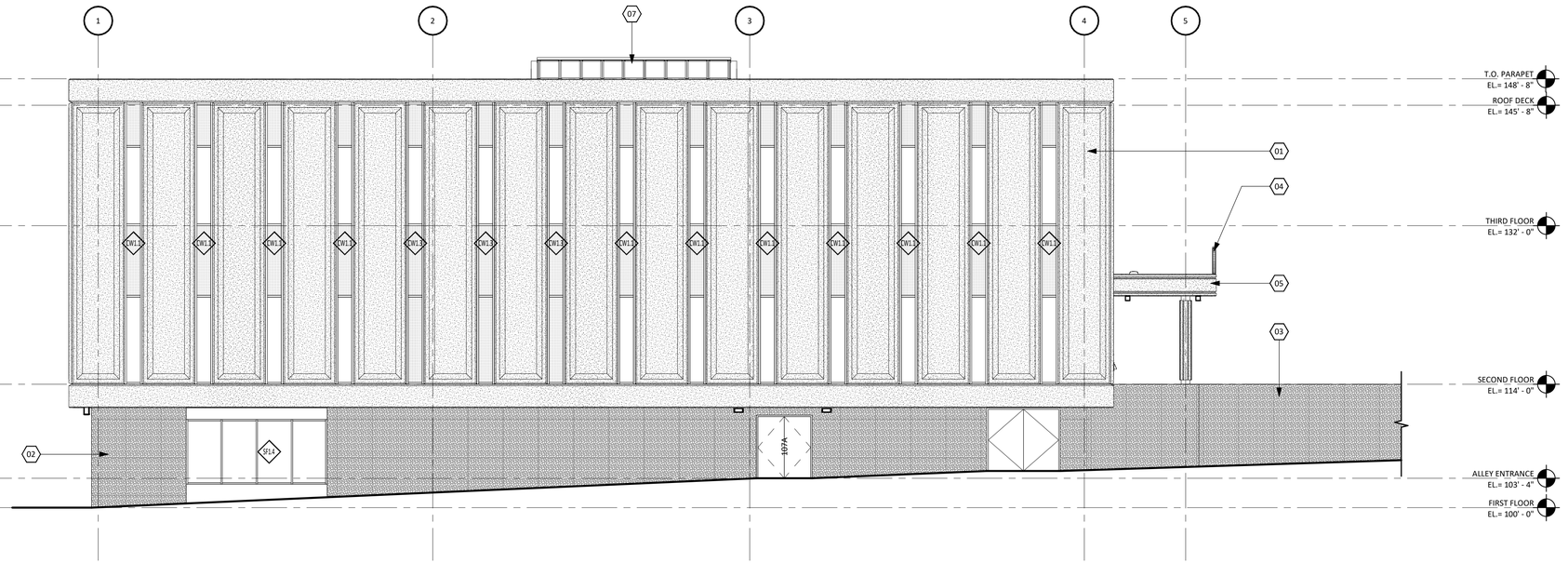
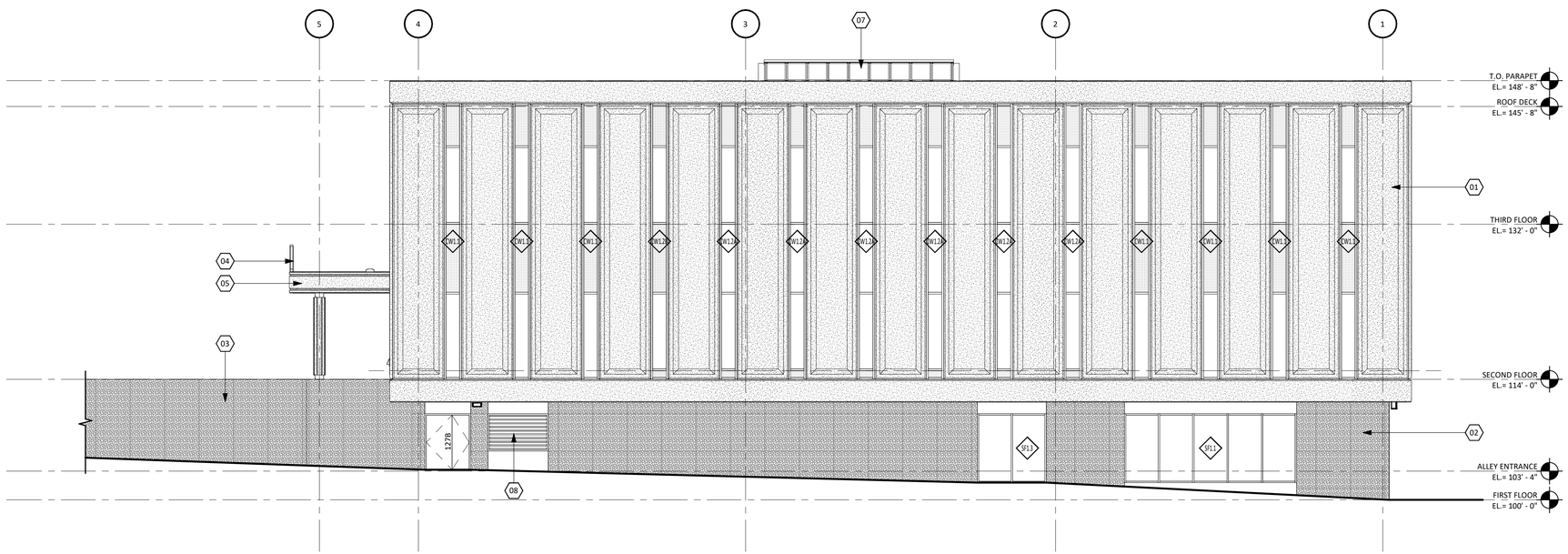


6C / A302 EXTERIOR ELEVATION - WEST

SCALE: 1/8" = 1'-0"



6A / A302 EXTERIOR ELEVATION - EAST

SCALE: 1/8" = 1'-0"

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION

EXT. ELEVATION GENERAL NOTES

A. BASE BID: ALL EXISTING EXTERIOR STOREFRONT AND CURTAINWALL IS TO REMAIN
B. ALTERNATE 2: REPLACE ALL EXISTING EXTERIOR STOERFRONT AND CURTAINWALL. REFER TO GLAZING ELEVATIONS

XX EXT. ELEVATIONS KEYNOTE

KEYNOTE	DESCRIPTION
01	EXISTING PRECAST CONCRETE PANELS TO REMAIN; TYP.
02	EXISTING CAST IN PLACE CONCRETE WALLS TO REMAIN EXISTING CAST IN PLACE CONCRETE WALLS TO REMAIN; TYP.
03	EXISTING CAST IN PLACE CONCRETE RETAINING WALLS TO REMAIN; TYP.
04	CANOPY MOUNTED EXTERIOR LIT SIGNAGE - SEE SIGNAGE PLAN
05	BASE BID: EXISTING CANOPY IS TO REMAIN. SEE ALTERNATE 3 FOR ENTRANCE CANOPY IMPROVEMENTS.
06	BASE BID: EXISTING PRECAST CONCRETE PANELS TO REMAIN - SEE ALTERNATE 4 FOR EXPANDED GLAZING AT THIS LOCATION.
07	NEW SKYLIGHT - SEE ROOF PLAN
08	EXISTING MECHANICAL LOUVER TO REMAIN.

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
7360
DATE 11 04 2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE
11/04/21
PHASE
CONSTRUCTION DOCUMENTS
PROJECT
21019
SHEET
A302
EXTERIOR ELEVATIONS

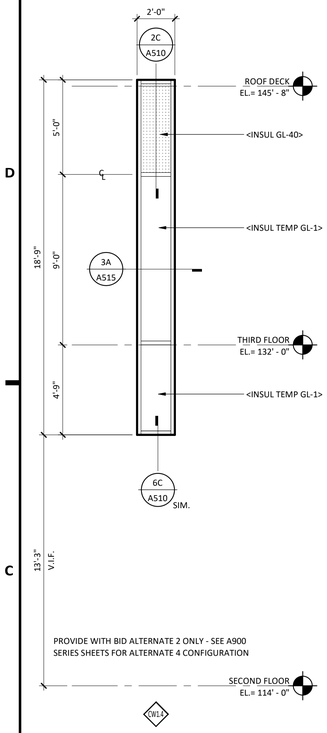
11/4/2021 10:12:19 AM

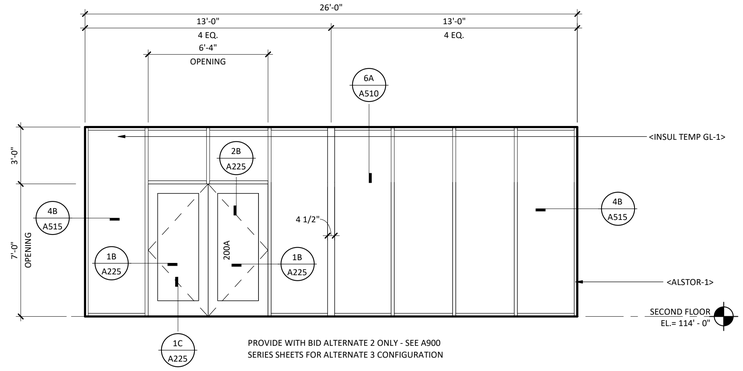
GLAZING ELEVATION GENERAL NOTES

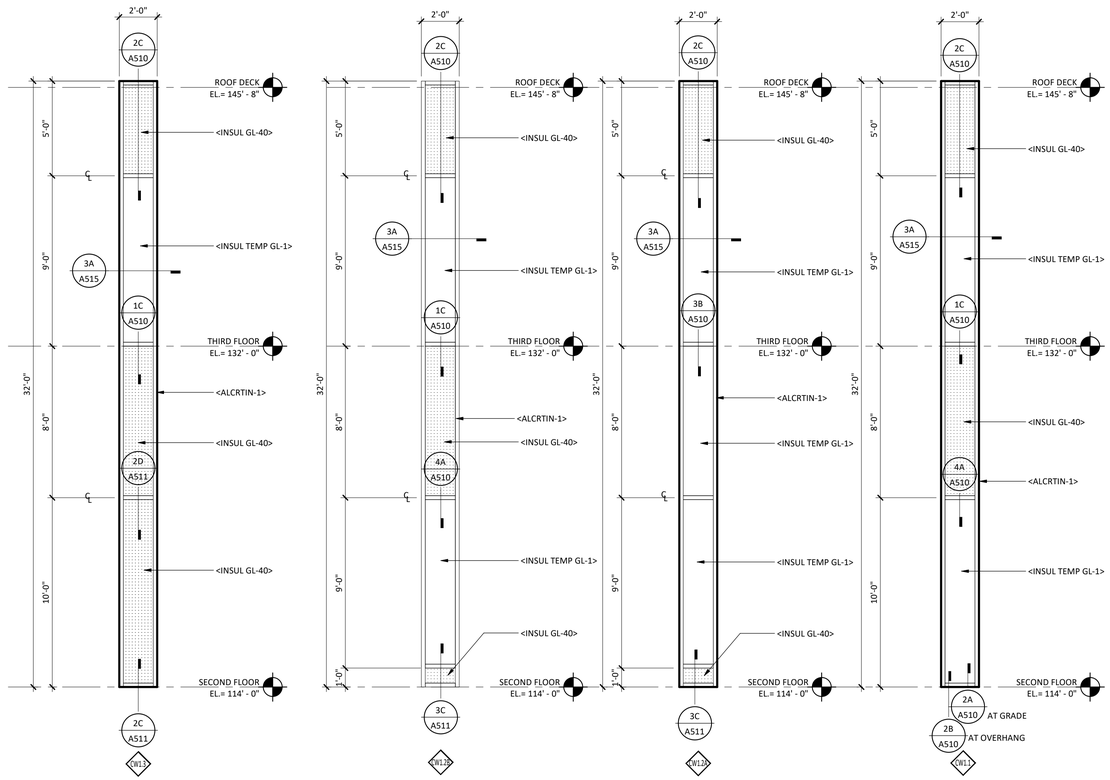
A. PROVIDE <INSUL TEMP GL-1> AT ALL EXTERIOR STOREFRONT AND CURTAINWALL UNLESS NOTED OTHERWISE
B. PROVIDE <TEMP GL-1> AT ALL INTERIOR STOREFRONT UNLESS NOTED OTHERWISE
C. FIELD VERIFY ALL EXISTING OPENINGS
D. ALL EXTERIOR CURTAINWALL AND STOREFRONT IS TO BE PROVIDED AS PART OF ALTERNATE 2. BASE BID: ALL EXTERIOR CURTAINWALL AND STOREFRONT IS TO REMAIN.
E. ALL STOREFRONT AND CURTAINWALL FRAMING IS TO BE ANODIZED FINISH UNLESS NOTED OTHERWISE. SEE SPEC FOR MORE INFORMATION.

SHEET MATERIAL ID LIST

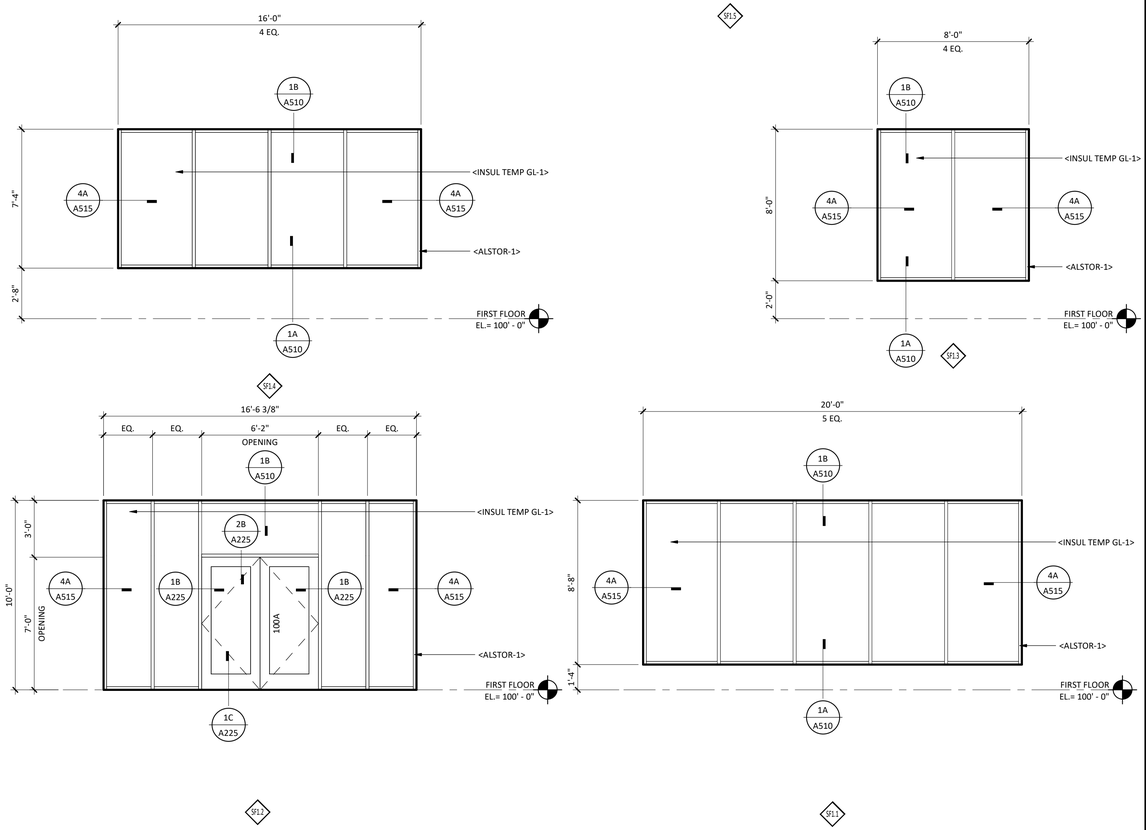
MATERIAL ID	SPEC SECTION & DESCRIPTION
ALCRTIN-1	08 4413 - GLAZED ALUMINUM CURTAIN WALLS
ALSTOR-1	08 4313 - ALUMINUM-FRAMED STOREFRONTS
INSUL GL-40	08 8000 - INSULATED SPANDREL GLAZING
INSUL TEMP GL-1	08 8000 - TEMPERED CLEAR INSULATED GLAZING







EXTERIOR ALUMINUM CURTAINWALL ELEVATIONS - 2 1/2" X 6" FRAMING U.N.O.



EXTERIOR ALUMINUM STOREFRONT ELEVATIONS - 2" X 4 1/2" FRAMING U.N.O.

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JENNIFER BURKE JACKSON
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DATE 11 04 2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A310
GLAZING ELEVATIONS

11/4/2021 10:12:23 AM

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION
ALSTOR-2	08 4313 - ALUMINUM-FRAMED STOREFRONTS
FILM-1	08 8000 - DECORATIVE FILM
TEMP GL-1	08 8000 - 1/4" TEMPERED GLASS

GLAZING ELEVATION GENERAL NOTES

A. PROVIDE <INSUL TEMP GL-1> AT ALL EXTERIOR STOREFRONT AND CURTAINWALL UNLESS NOTED OTHERWISE
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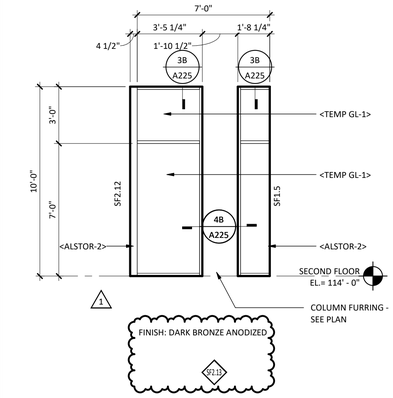
STATE OF NORTH DAKOTA

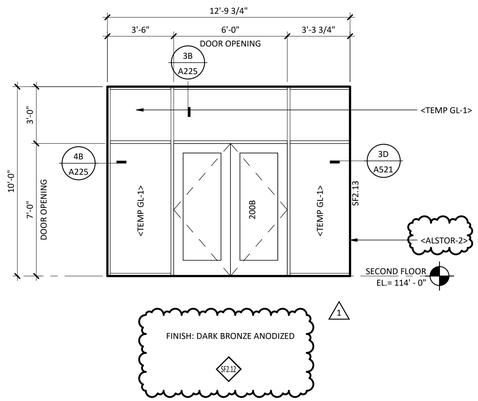
REVISION SCHEDULE

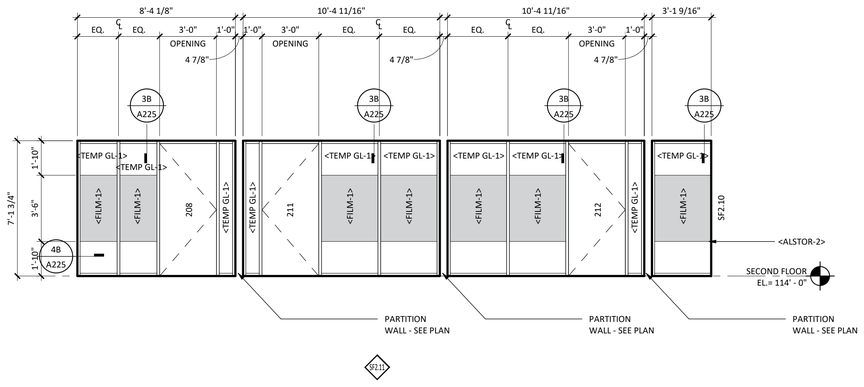
NO.	DESCRIPTION	DATE
1	ADDENDUM 1	11/12/21

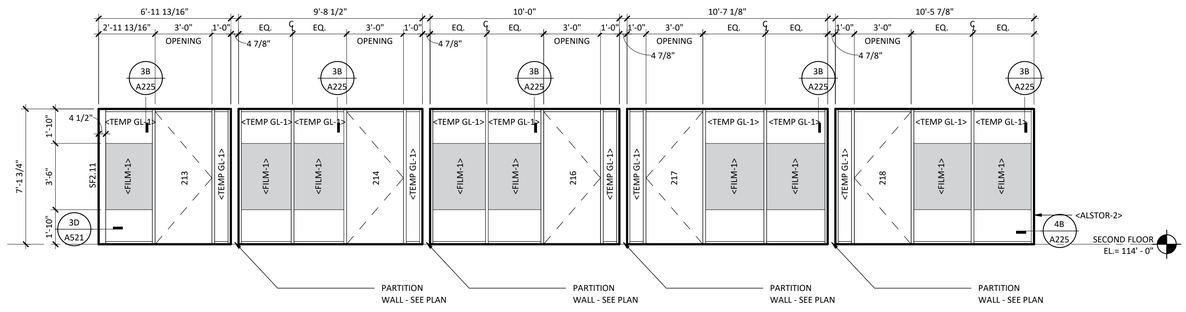
CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

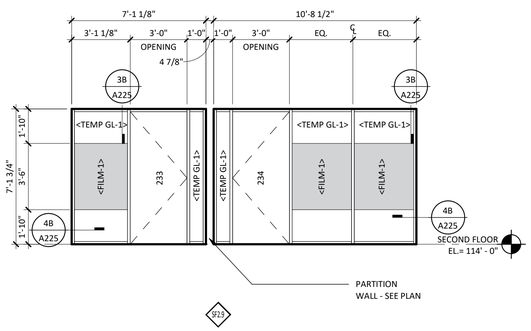
CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A311
GLAZING ELEVATIONS

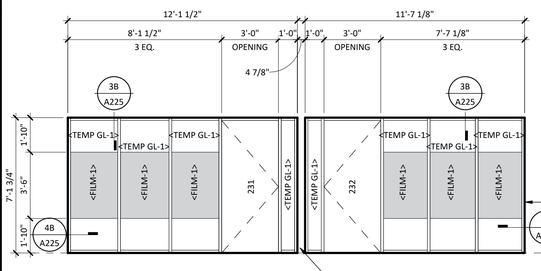


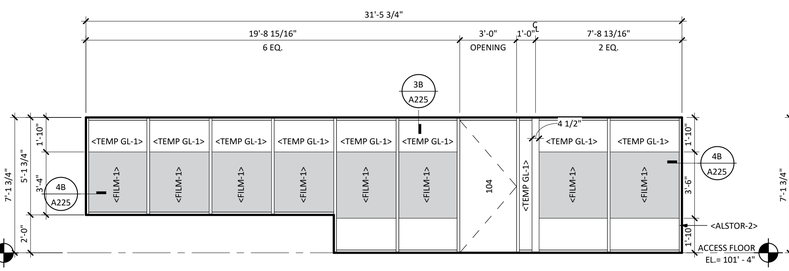


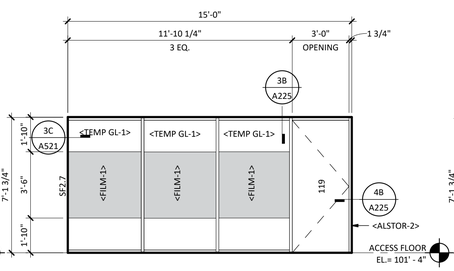


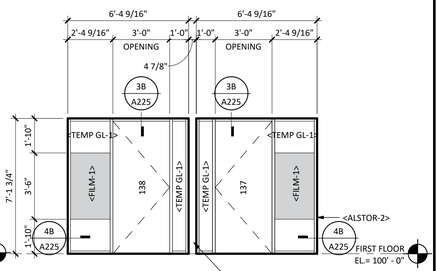


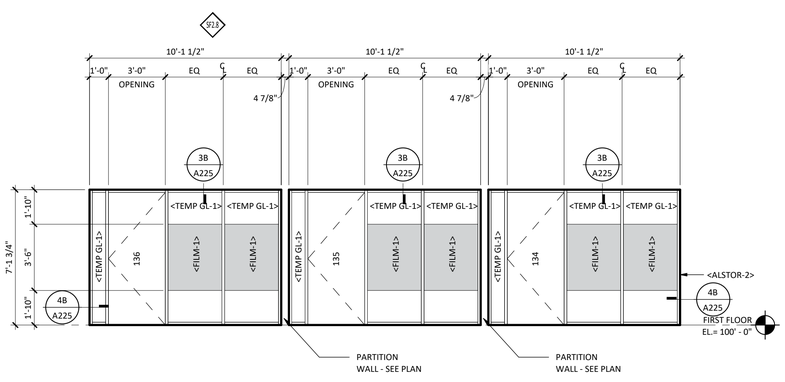


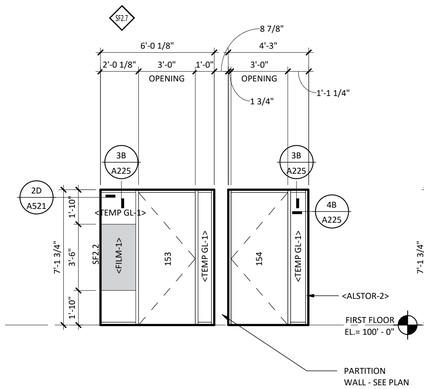


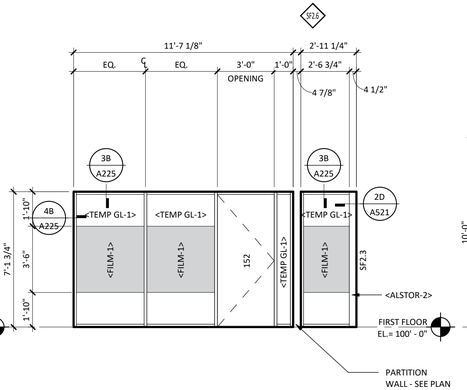


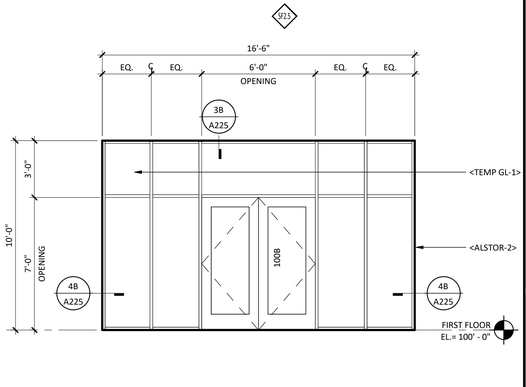












INTERIOR ALUMINUM STOREFRONT ELEVATIONS - 1 3/4" X 4 1/2" FRAMING U.N.O.

11/12/2021 11:43:38 AM

GLAZING ELEVATION GENERAL NOTES

A. PROVIDE <INSUL TEMP GL-1> AT ALL EXTERIOR STOREFRONT AND CURTAINWALL UNLESS NOTED OTHERWISE
B. PROVIDE <TEMP GL-1> AT ALL INTERIOR STOREFRONT UNLESS NOTED OTHERWISE
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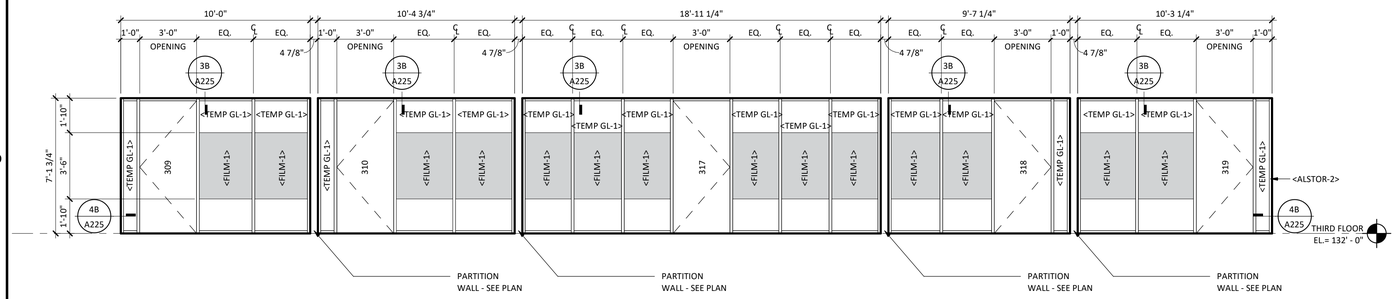
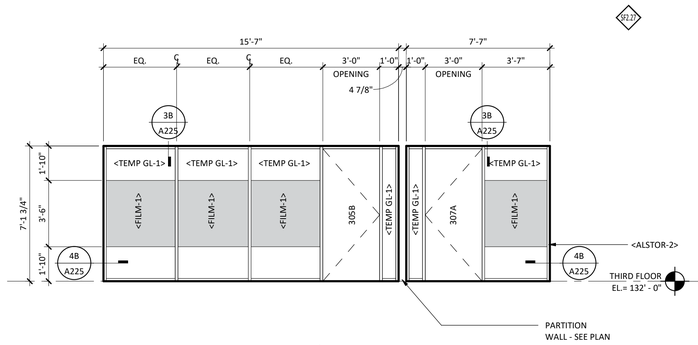
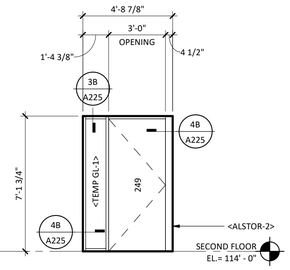
E. ALL STOREFRONT AND CURTAINWALL FRAMING IS TO BE ANODIZED FINISH UNLESS NOTED OTHERWISE. SEE SPEC FOR MORE INFORMATION.

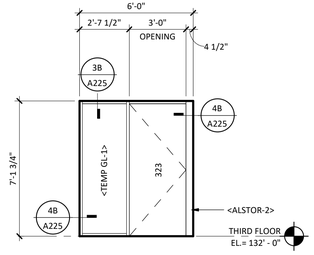
SHEET MATERIAL ID LIST

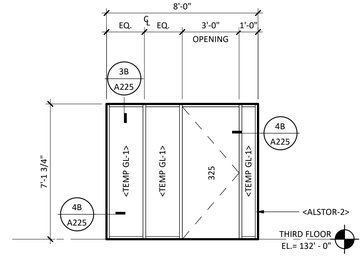
MATERIAL ID	SPEC SECTION & DESCRIPTION
ALSTOR-2	08 4313 - ALUMINUM-FRAMED STOREFRONTS
FILM-1	08 8000 - DECORATIVE FILM
TEMP GL-1	08 8000 - 1/4" TEMPERED GLASS

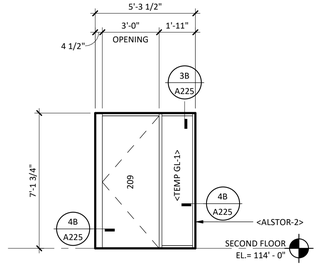


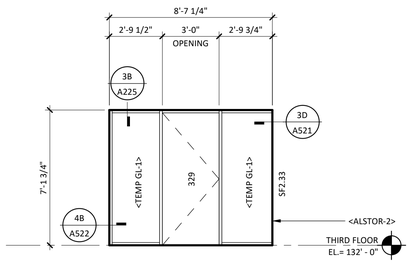


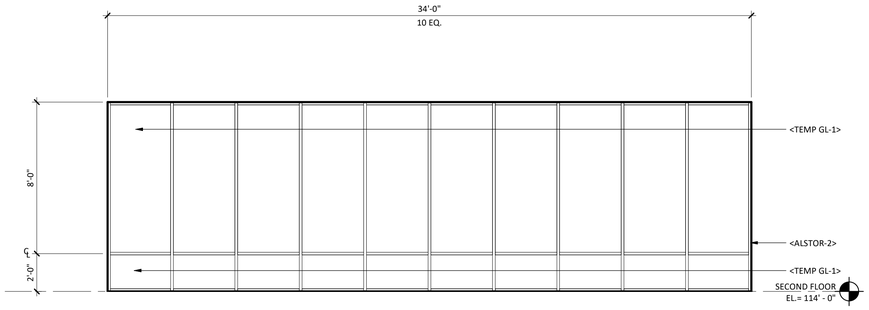


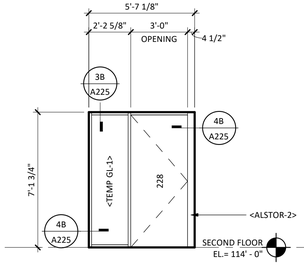


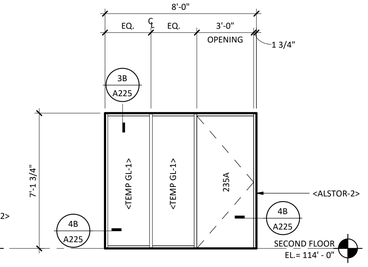




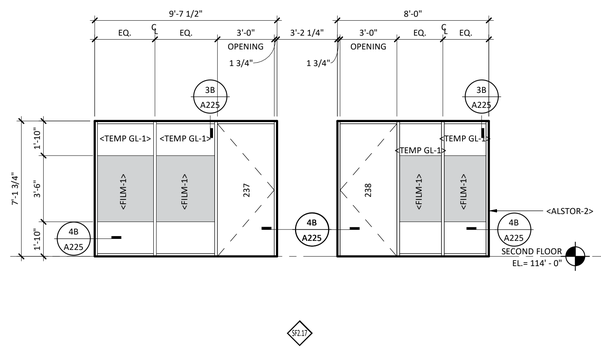


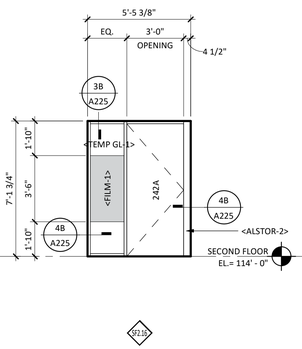


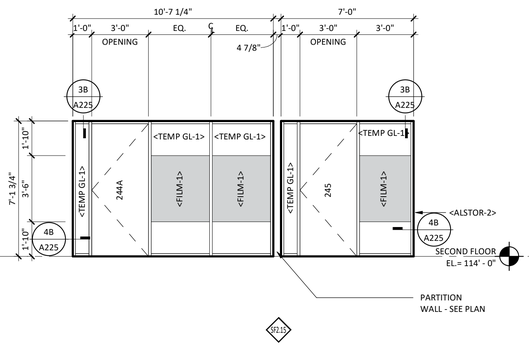


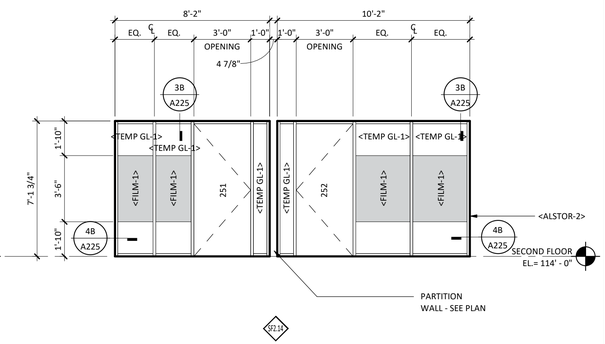


BASE BID ONLY - SEE A900 SERIES SHEETS FOR BID ALTERNATES









INTERIOR ALUMINUM STOREFRONT ELEVATIONS - 1 3/4" X 4 1/2" FRAMING U.N.O.

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
7369
DATE 11 04 2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET **A312**
GLAZING ELEVATIONS

11/4/2021 10:12:35 AM

GLAZING ELEVATION GENERAL NOTES

A. PROVIDE <INSUL TEMP GL-1> AT ALL EXTERIOR STOREFRONT AND CURTAINWALL UNLESS NOTED OTHERWISE
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SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION
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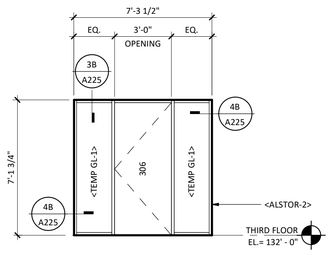
FILM-1	08 8000 - DECORATIVE FILM
TEMP GL-1	08 8000 - 1/4" TEMPERED GLASS



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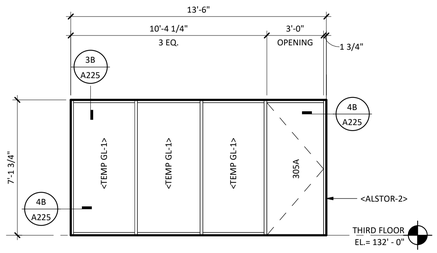

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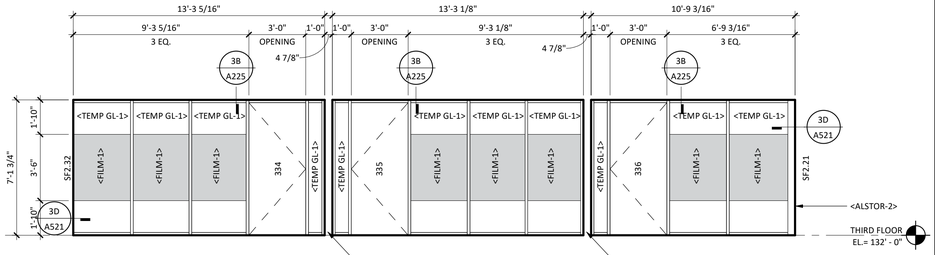

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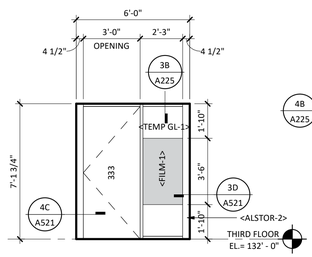

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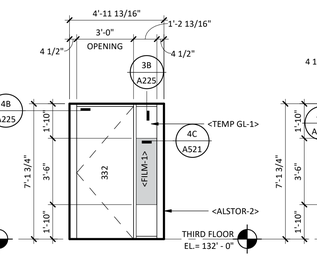

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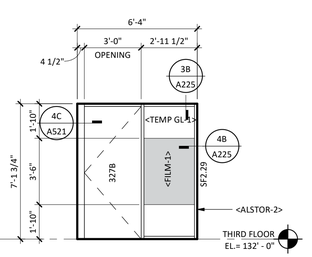

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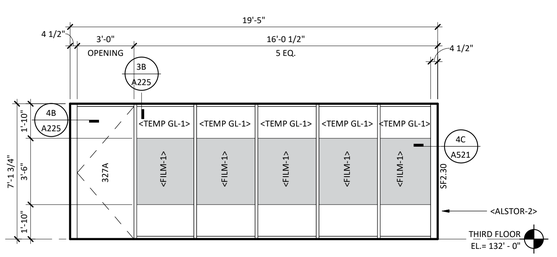

SF2.30

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
DATE 11.04.2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE

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CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466

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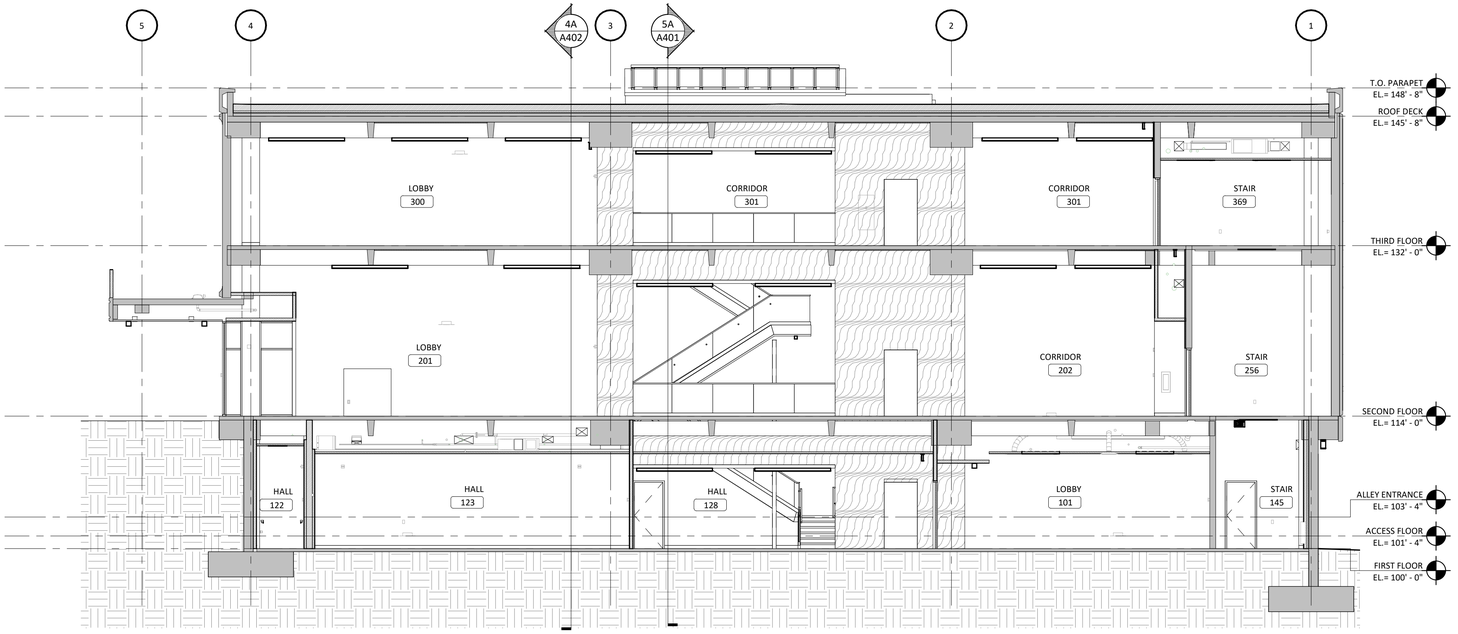
11/04/21

PHASE
CONSTRUCTION DOCUMENTS

PROJECT
21019

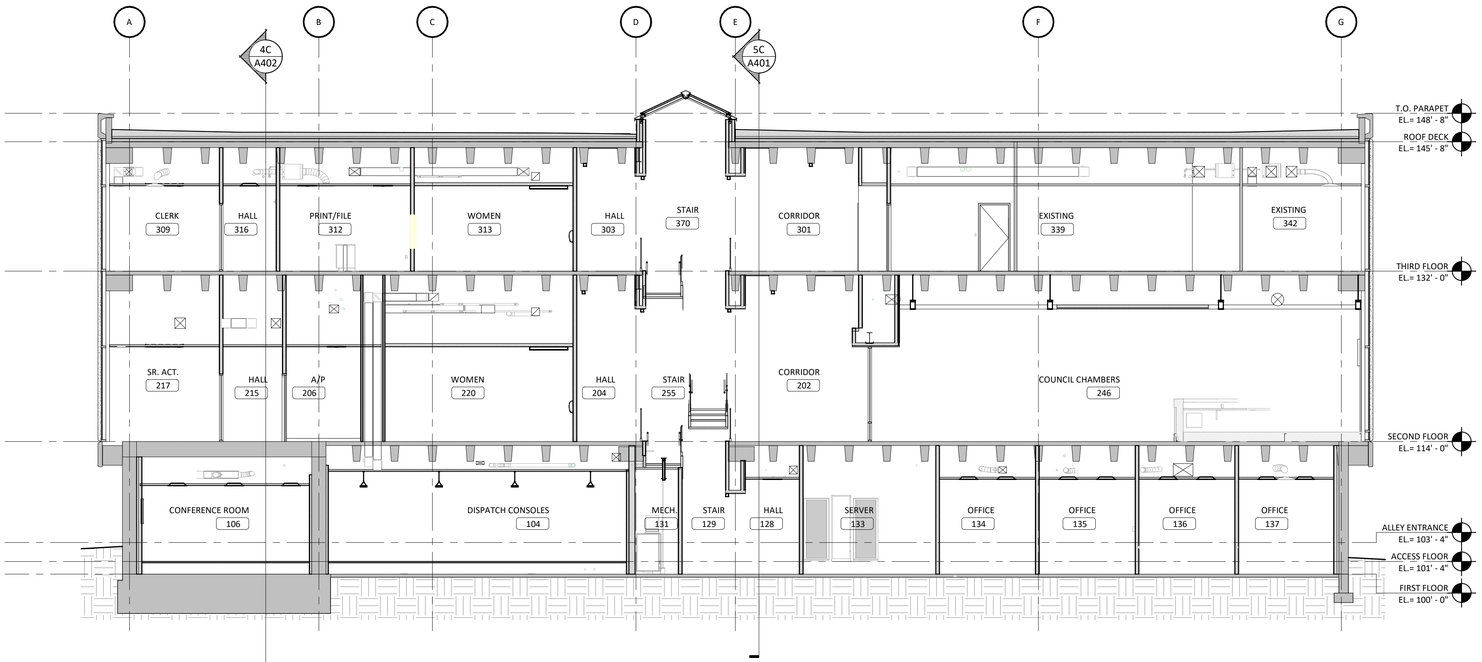
SHEET
A313
GLAZING ELEVATIONS

11/4/2021 10:12:39 AM



5C A401 N-S SECTION

SCALE: 1/8" = 1'-0"



5A A401 E-W SECTION

SCALE: 1/8" = 1'-0"

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
DATE 11 04 2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466

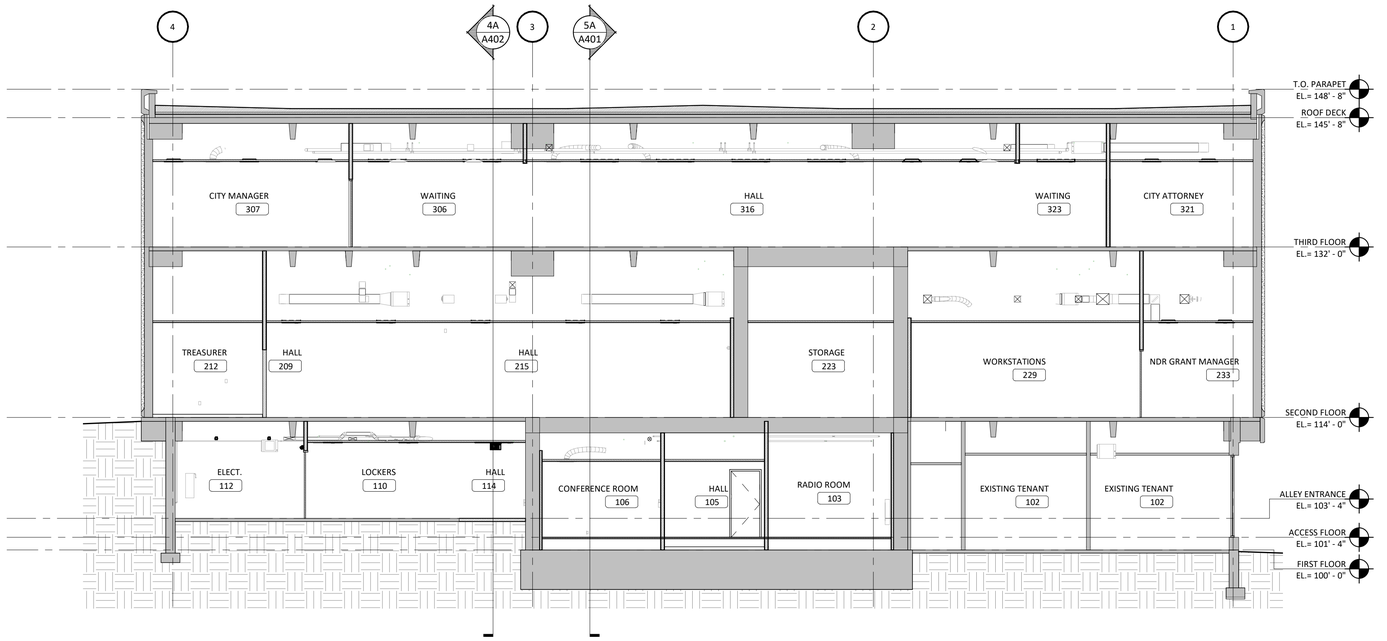
DATE
11/04/21

PHASE
CONSTRUCTION DOCUMENTS

PROJECT
21019

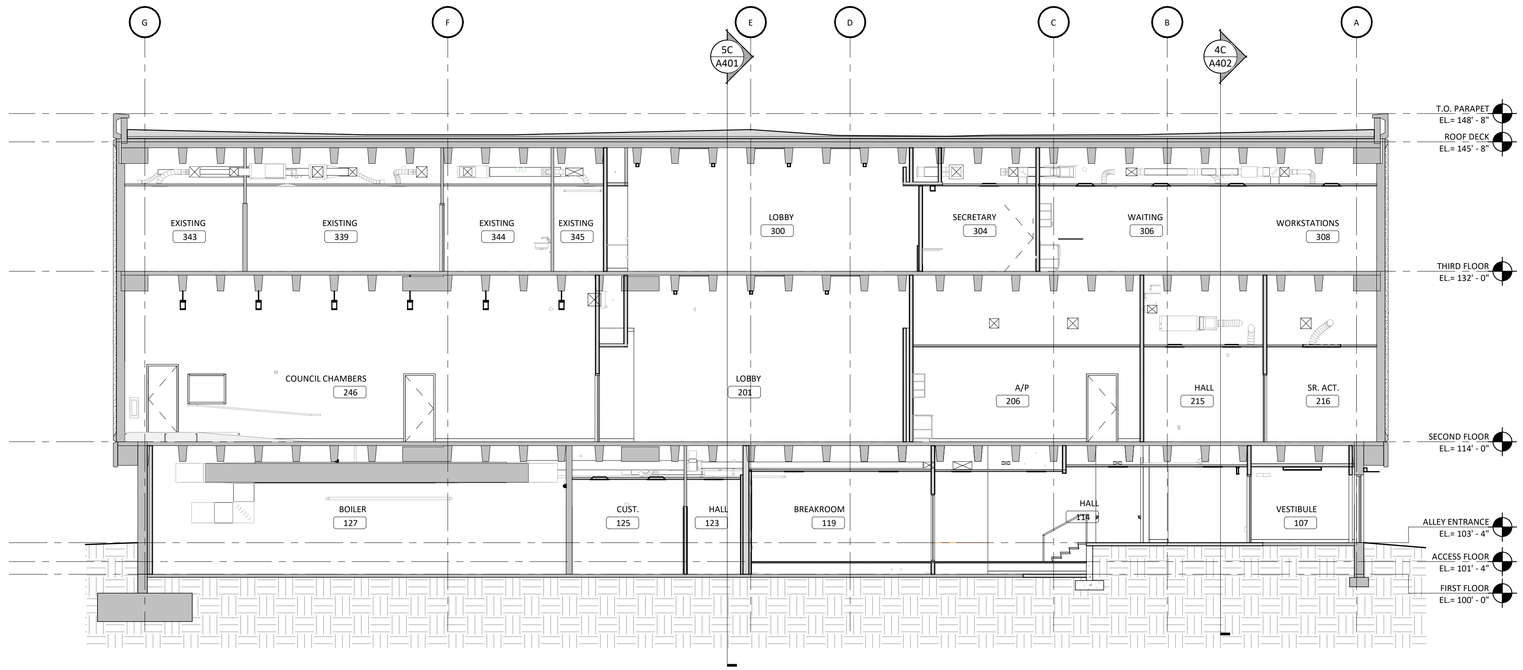
SHEET
A401
BUILDING SECTIONS

11/4/2021 10:12:45 AM



4C
A402 N-S SECTION 2

SCALE: 1/8" = 1'-0"



4A
A402 E-W SECTION 2

SCALE: 1/8" = 1'-0"

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MINOT, ND

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CONSTRUCTION DOCUMENTS

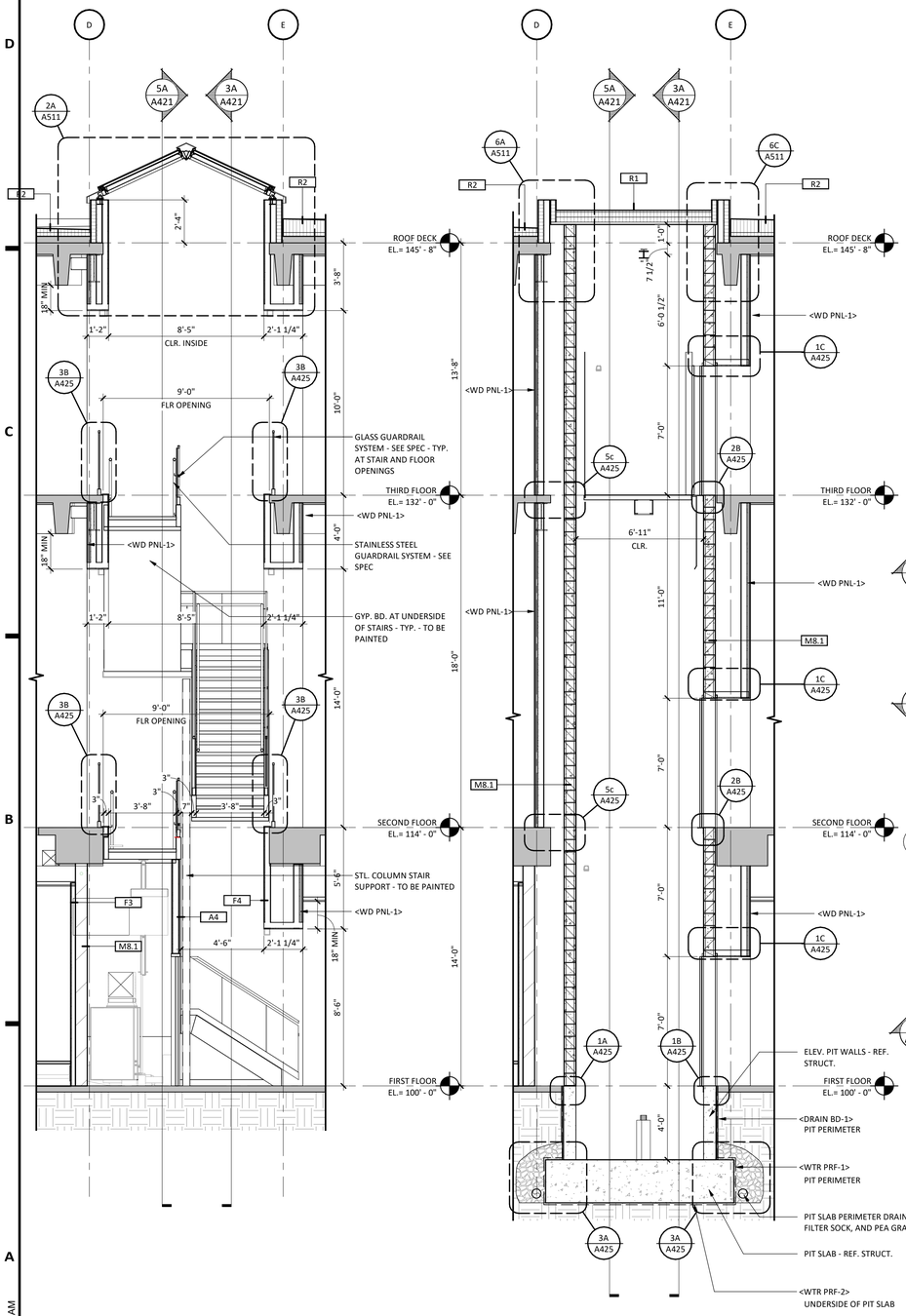
PROJECT
21019

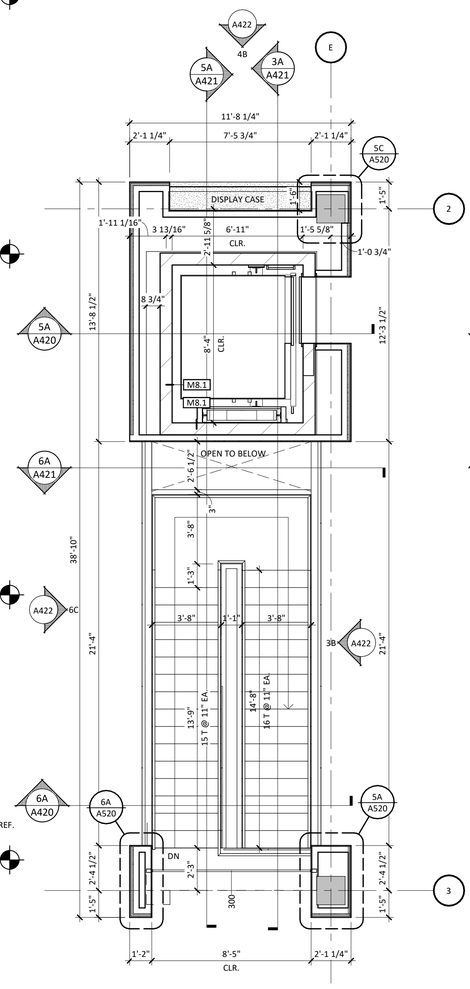
SHEET
A402
BUILDING SECTIONS

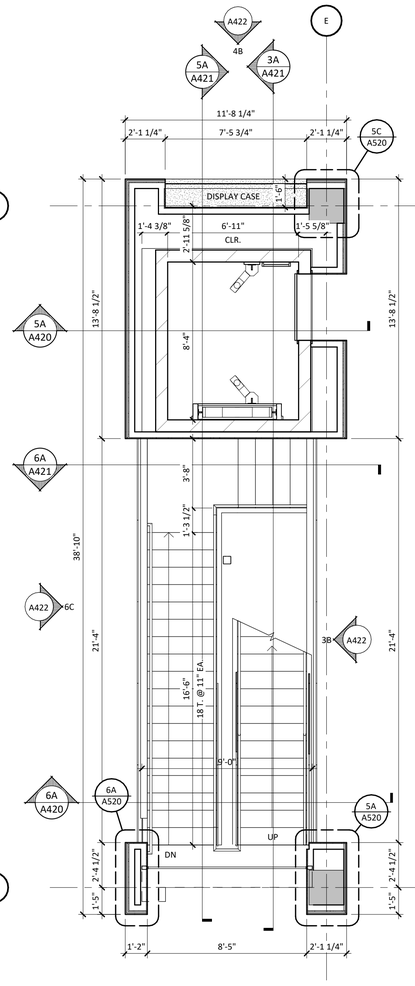
11/4/2021 10:12:51 AM

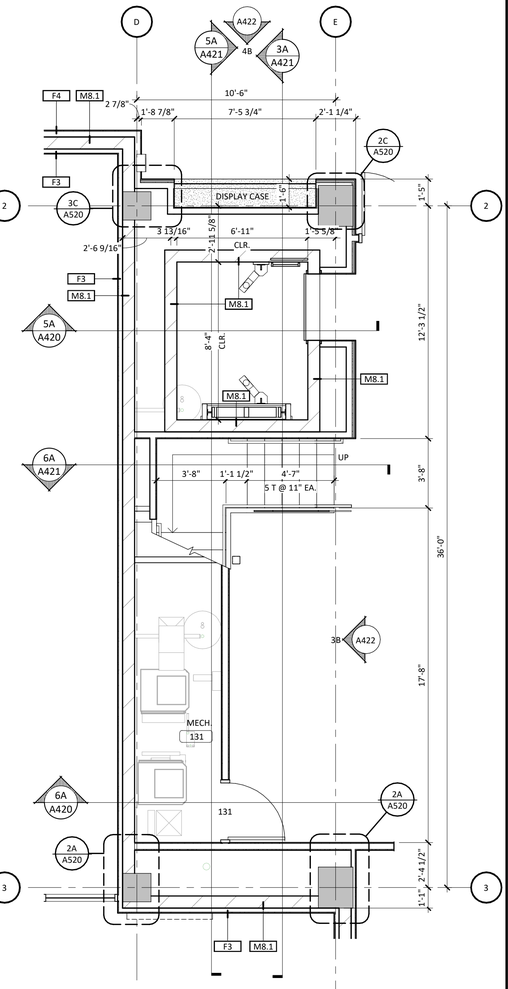
SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION
DRAIN BD-1	07 1300 - DRAINAGE BOARD
WD PNL-1	09 5100 - WOOD WALL PANEL
WTR PRF-1	07 1300 - SELF-ADHERED SHEET WATERPROOFING
WTR PRF-2	07 1300 - PRE-APPLIED SHEET WATERPROOFING









6A A420 EAST/WEST STAIR SECTION
SCALE: 1/4" = 1'-0"

5A A420 EAST/WEST ELEV. SECTION
SCALE: 1/4" = 1'-0"

4A A420 STAIR/ELEVATOR - THIRD FLOOR
SCALE: 1/4" = 1'-0"

3A A420 STAIR/ELEVATOR - SECOND FLOOR
SCALE: 1/4" = 1'-0"

2A A420 STAIR/ELEVATOR - FIRST FLOOR
SCALE: 1/4" = 1'-0"

11/4/2021 10:12:59 AM

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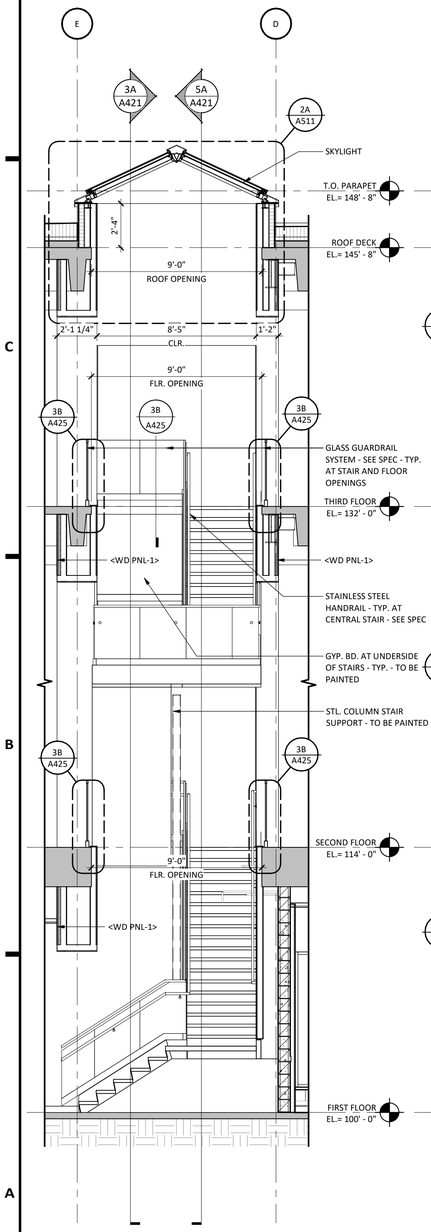
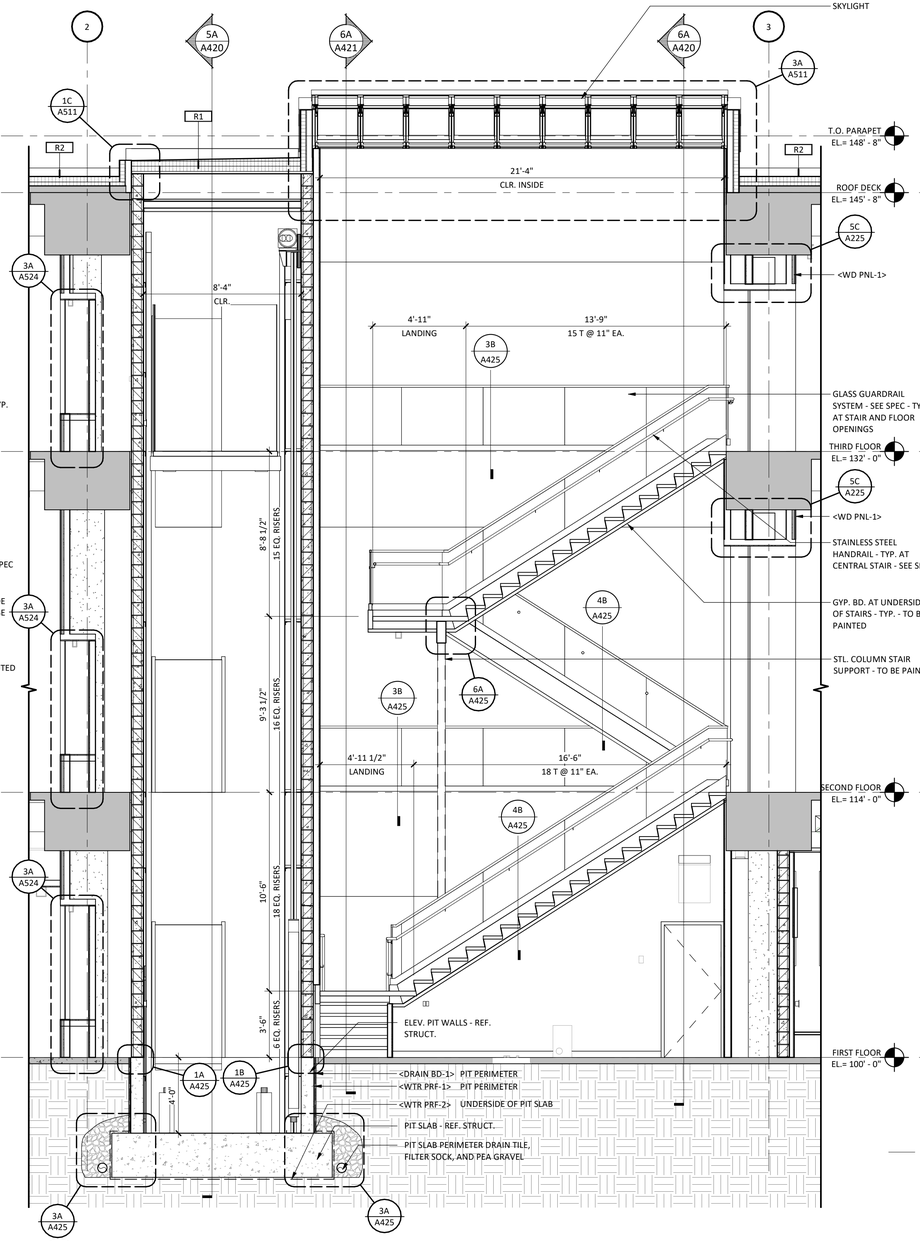
SHEET
A420
VERTICAL CIRCULATION

SHEET MATERIAL ID LIST

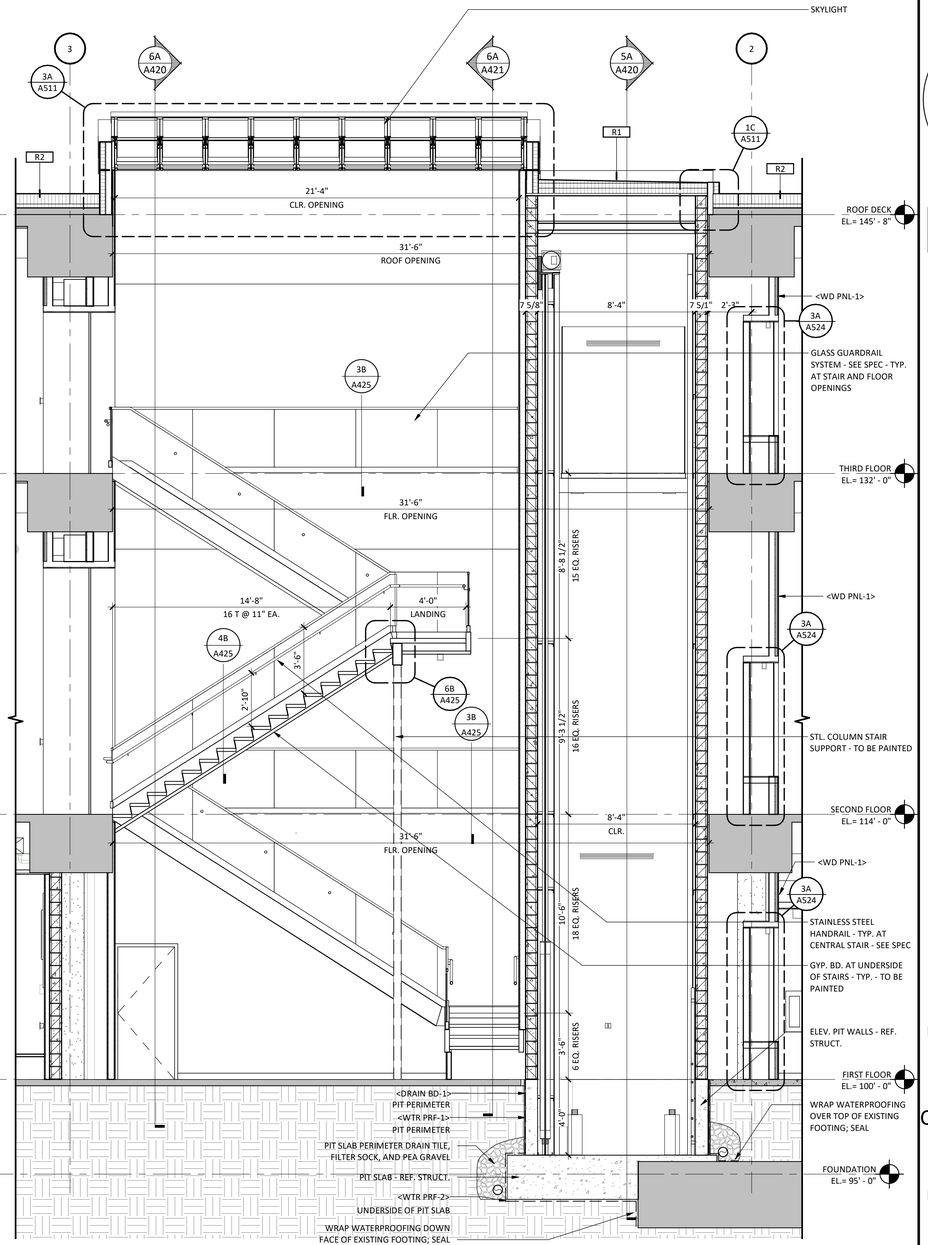
MATERIAL ID	SPEC SECTION & DESCRIPTION
DRAIN BD-1	07 1300 - DRAINAGE BOARD
WD PNL-1	09 5100 - WOOD WALL PANEL
WTR PRF-1	07 1300 - SELF-ADHERED SHEET WATERPROOFING
WTR PRF-2	07 1300 - PRE-APPLIED SHEET WATERPROOFING



6A A421 STAIR SECTION
SCALE: 1/4" = 1'-0"



5A A421 NORTH/SOUTH ELEV. & STAIR SECTION 2
SCALE: 1/4" = 1'-0"



3A A421 NORTH/SOUTH ELEV. & STAIR SECTION 1
SCALE: 1/4" = 1'-0"

11/4/2021 10:13:08 AM

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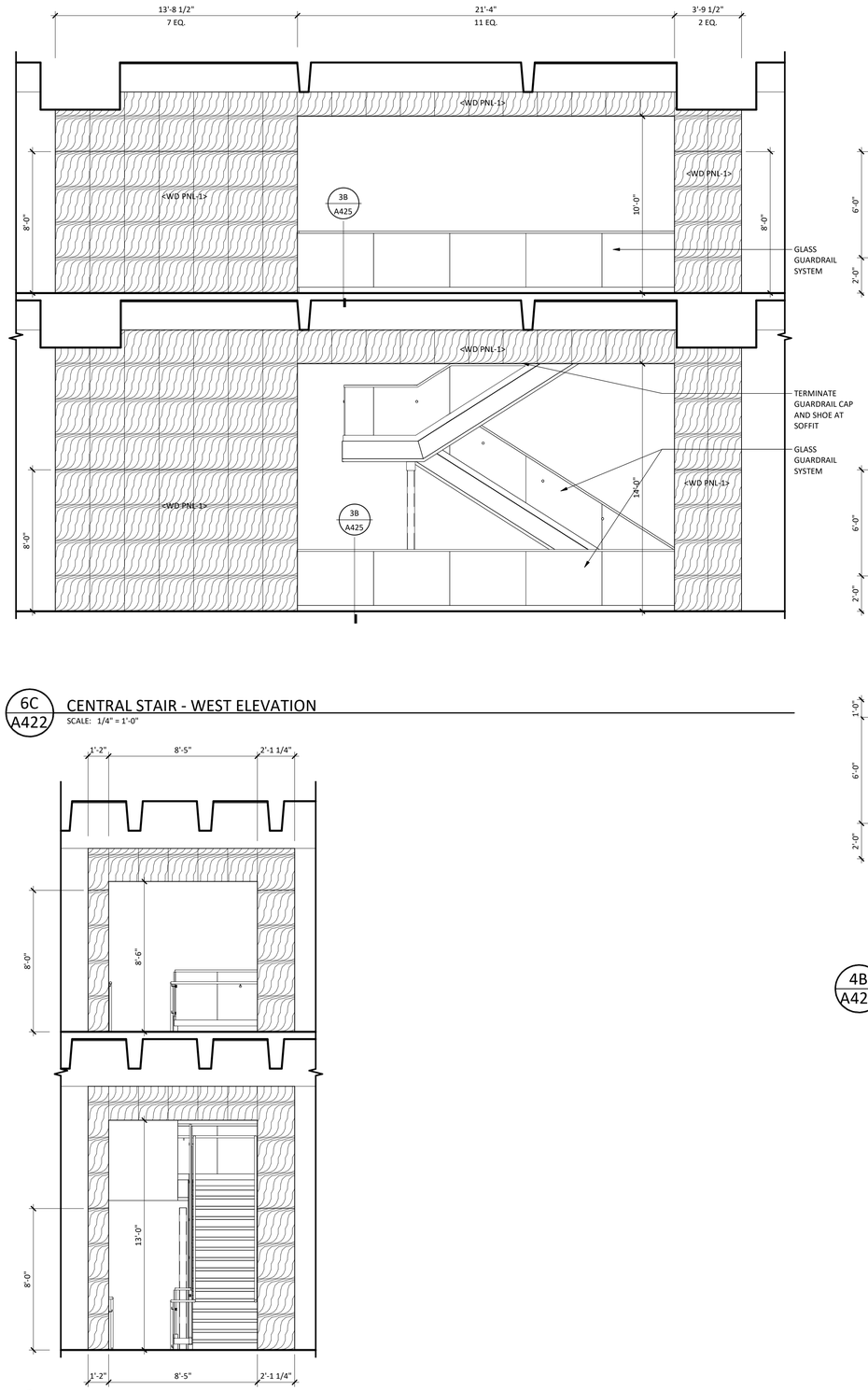
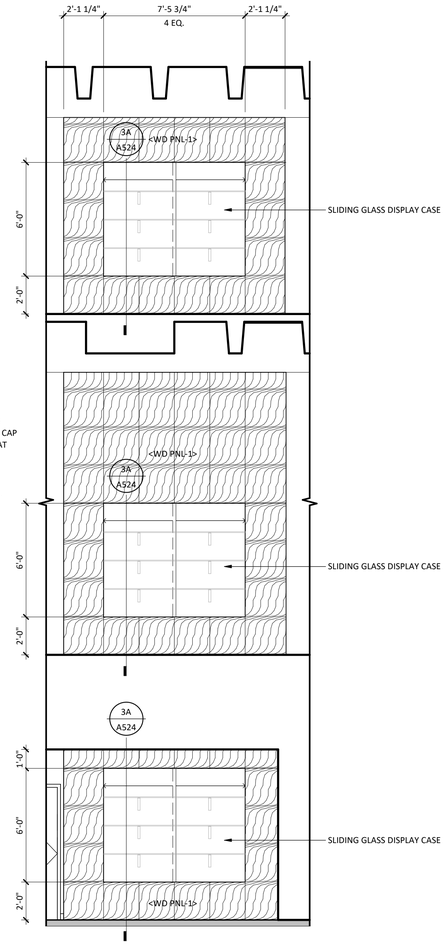


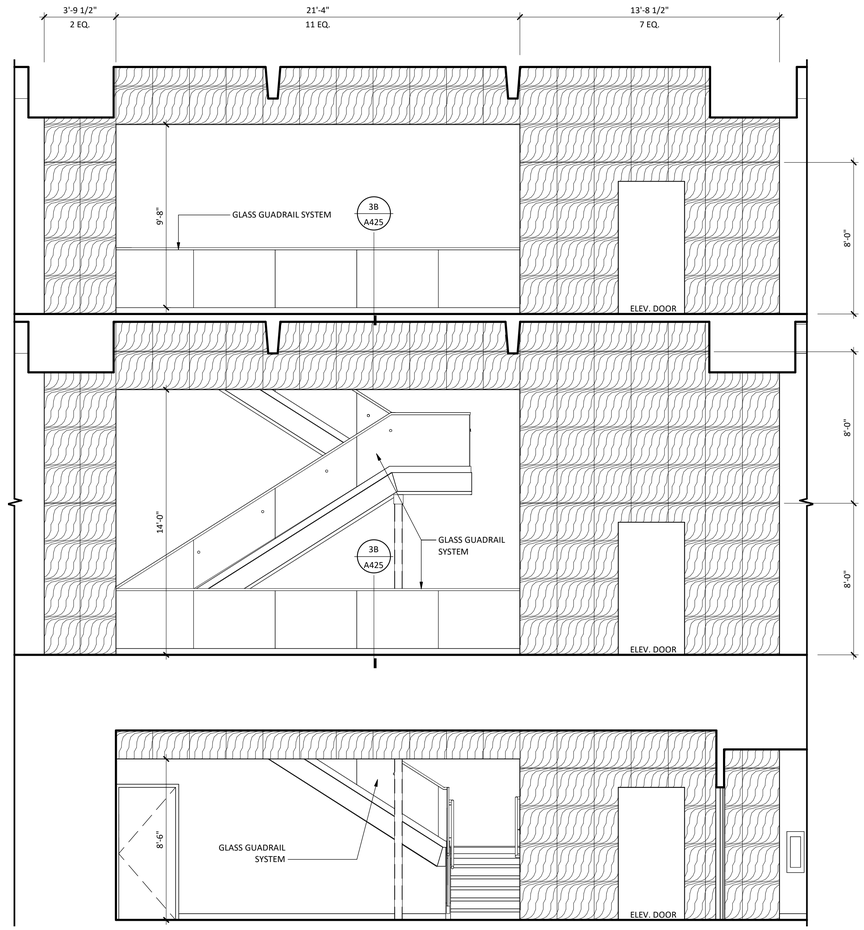
6C A422 CENTRAL STAIR - WEST ELEVATION

SCALE: 1/4" = 1'-0"



4B A422 CENTRAL STAIR - NORTH ELEVATION

SCALE: 1/4" = 1'-0"



3B A422 CENTRAL STAIR - EAST ELEVATION

SCALE: 1/4" = 1'-0"

6A A422 CENTRAL STAIR - SOUTH ELEVATION

SCALE: 1/4" = 1'-0"

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION
WD PNL-1	09 5100 - WOOD WALL PANEL

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A422
VERTICAL CIRCULATION

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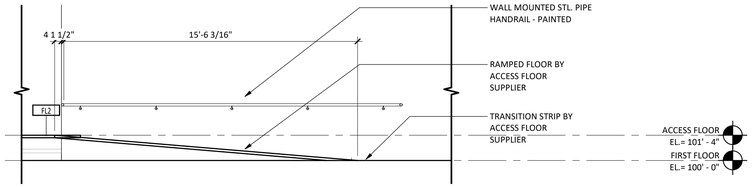
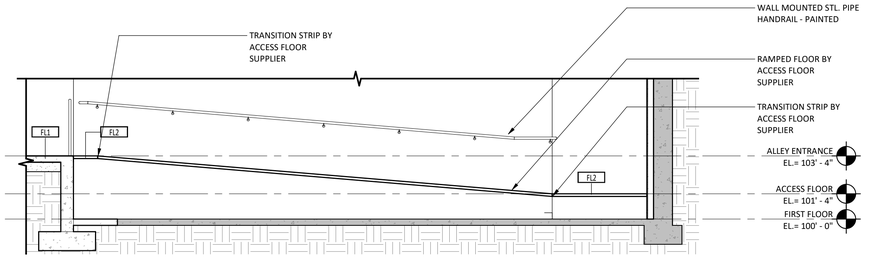
SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION



3D A423 PSAP EAST RAMP SECTION
SCALE: 1/4" = 1'-0"



3C A423 PSAP WEST RAMP SECTION
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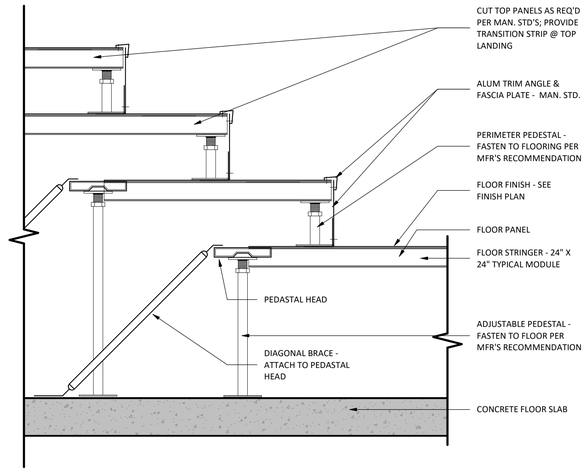

5A A423 ACCESS FLOOR STAIRS
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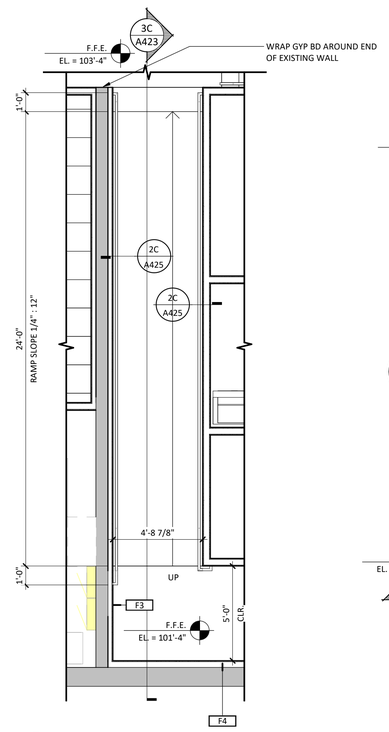
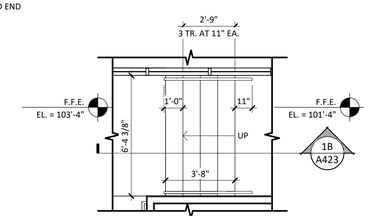
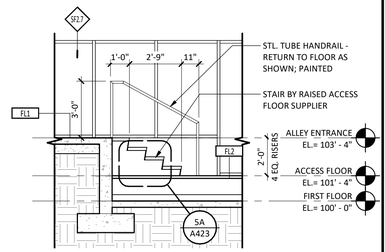


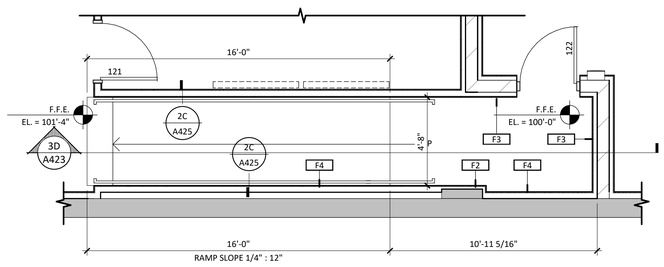
3A A423 FIRST FLOOR - PSAP RAMP WEST
SCALE: 1/4" = 1'-0"



2B A423 FIRST FLOOR - PSAP STAIR
SCALE: 1/4" = 1'-0"



1B A423 PSAP STAIR SECTION
SCALE: 1/4" = 1'-0"



2A A423 FIRST FLOOR - PSAP RAMP EAST
SCALE: 1/4" = 1'-0"

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MINOT, ND

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DATE
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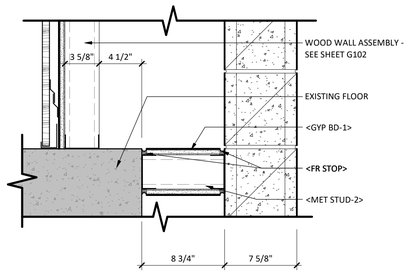
CONSTRUCTION DOCUMENTS
PROJECT
21019
SHEET
A423
VERTICAL CIRCULATION

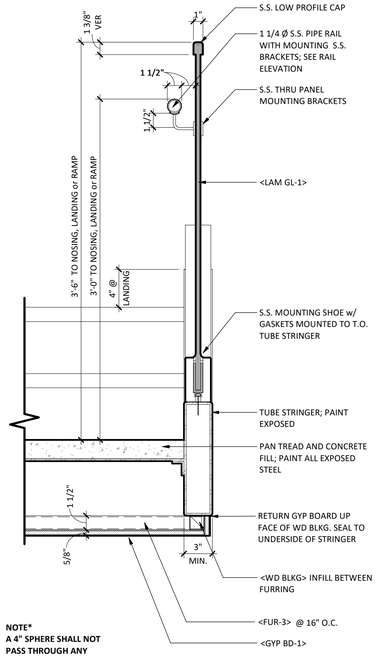
11/4/2021 10:13:18 AM

SHEET MATERIAL ID LIST

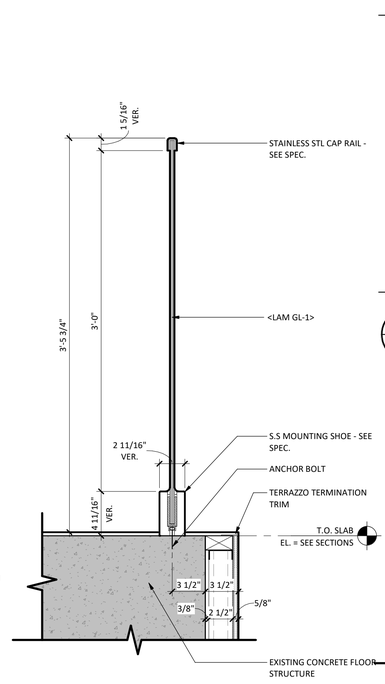
MATERIAL ID	SPEC SECTION & DESCRIPTION
DRAIN BD-1	07 1300 - DRAINAGE BOARD
FR STOP	07 8400 - THROUGH PENETRATION FIRESTOPPING
FUR-3	09 2116 - 1-1/2" COLD ROLLED FURRING CHANNEL
GYP BD-1	09 2116 - 5/8" TYPE X GYPSUM BOARD
LAM GL-1	08 8000 - 2 LAYERS OF 1/8" GLASS WITH 0.060 PVB LAYER
MET STUD-2	09 2116 - NON-LOADBEARING METAL STUDS, 20 GA
SEALANT-1	07 9200 - JOINT SEALANT OR CAULKING WITH OR WITHOUT BACKER ROD
WD BLKG	06 1000 - WOOD BLOCKING
WD PNL-1	09 5100 - WOOD WALL PANEL
WTR PRF-1	07 1300 - SELF-ADHERED SHEET WATERPROOFING
WTR PRF-2	07 1300 - PRE-APPLIED SHEET WATERPROOFING



5c A425 FLOOR EDGE AT ELEV. SHAFT
SCALE: 1 1/2" = 1'-0"



4B A425 STAIR GUARDRAIL
SCALE: 1 1/2" = 1'-0"



3B A425 GUARDRAIL AT FLOOR EDGE
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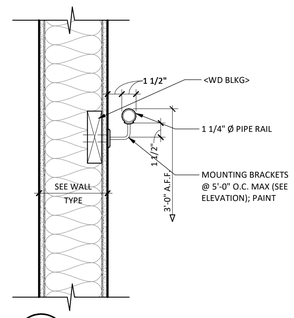
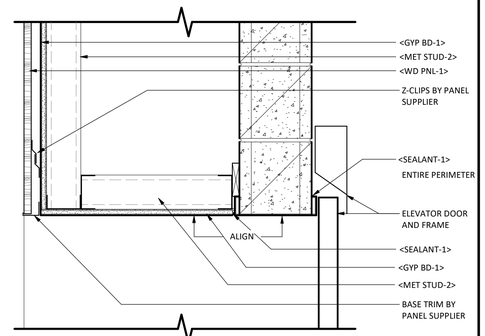
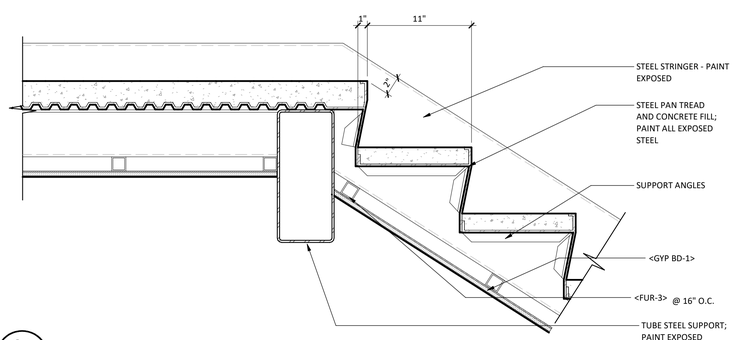


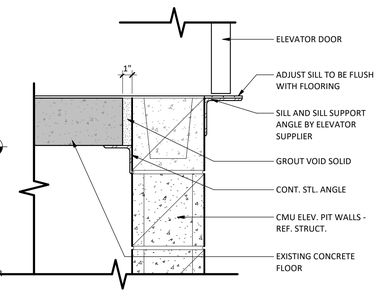
2C A425 WALL MOUNTED RAIL @ STUDS
SCALE: 1 1/2" = 1'-0"



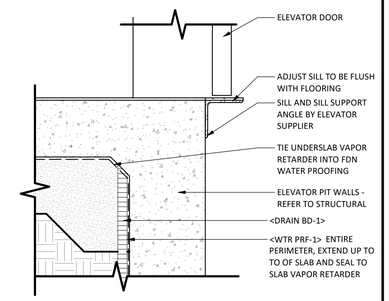
1C A425 ELEV. DOOR HEAD
SCALE: 1 1/2" = 1'-0"



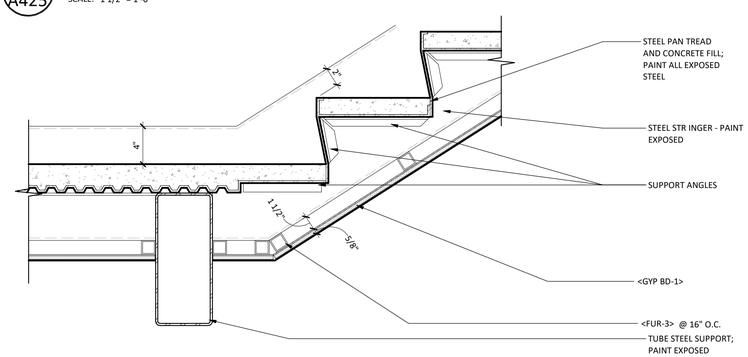
6B A425 STAIR LANDING D
SCALE: 1 1/2" = 1'-0"



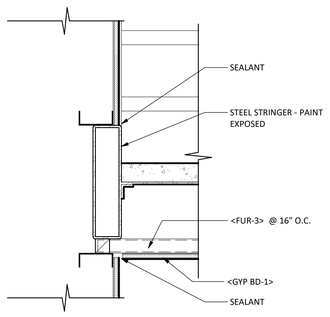
2B A425 ELEV. DOOR SILL AT FLOOR
SCALE: 1 1/2" = 1'-0"



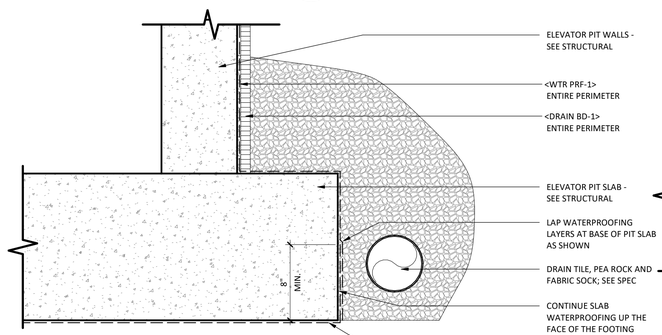
1B A425 ELEV. DOOR SILL AT PIT
SCALE: 1 1/2" = 1'-0"



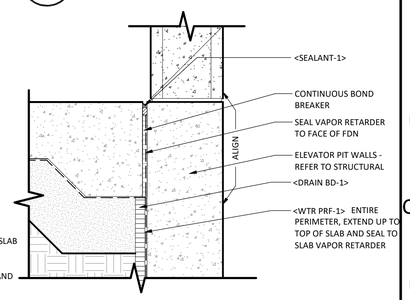
6A A425 STAIR LANDING C
SCALE: 1 1/2" = 1'-0"



4A A425 TREAD at STUD WALL
SCALE: 1 1/2" = 1'-0"



3A A425 PIT SLAB WATERPROOFING
SCALE: 1 1/2" = 1'-0"



1A A425 ELEV. PIT AT SLAB ON GRADE
SCALE: 1 1/2" = 1'-0"

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A425
VERTICAL CIRCULATION DETAILS

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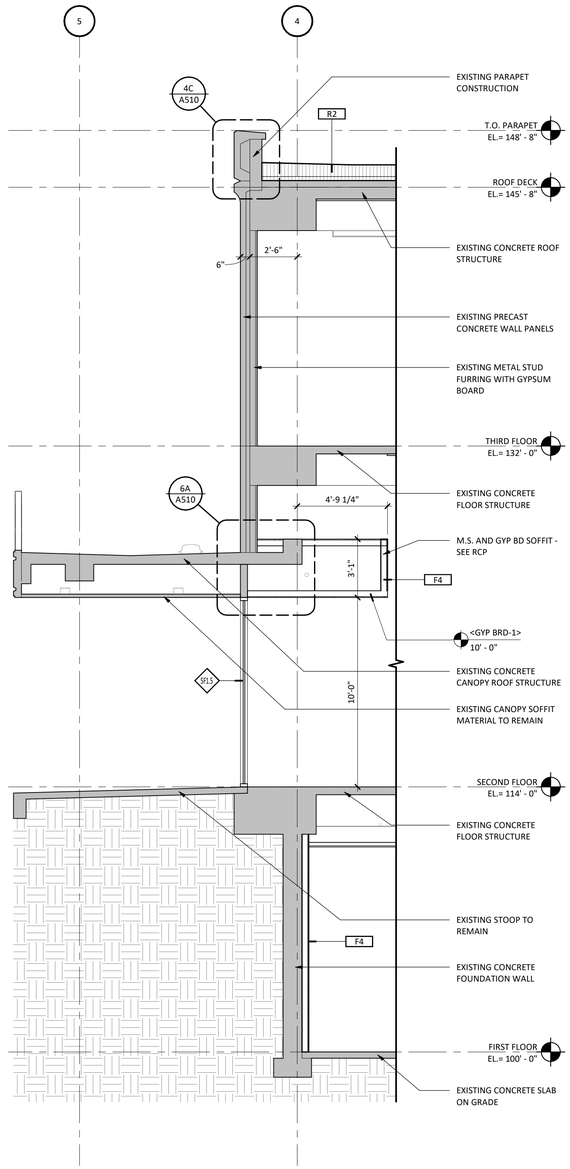
SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION



5A A501 CANOPY SECTION - BASE BID
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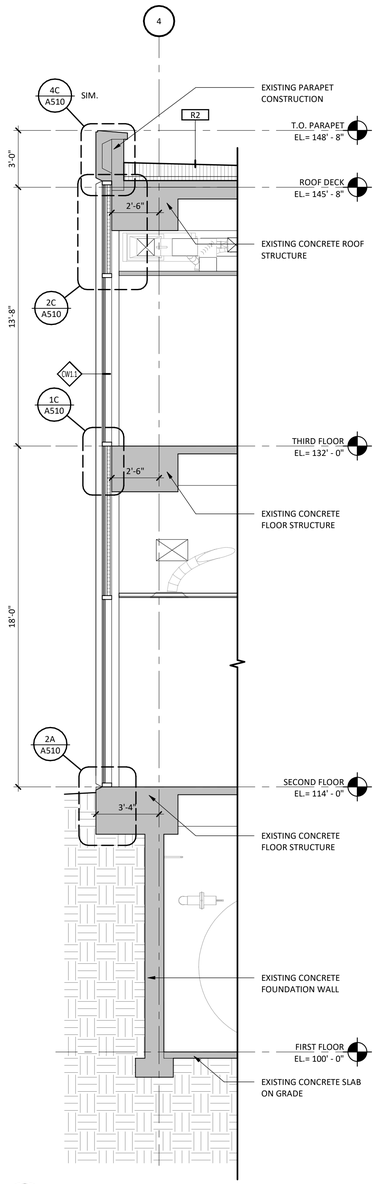
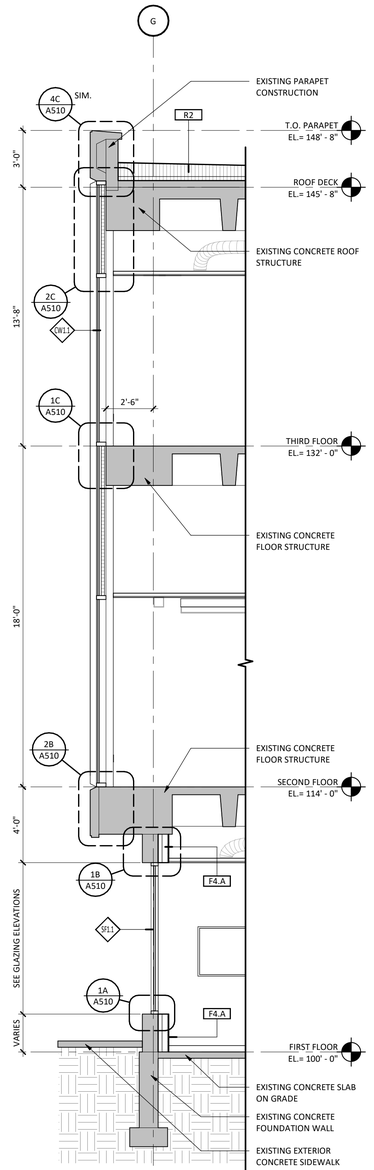


3A A501 TYP. SOUTH WALL SECTION AT WNDW.
SCALE: 1/4" = 1'-0"



2A A501 TYP. WALL SECTION AT WINDOW
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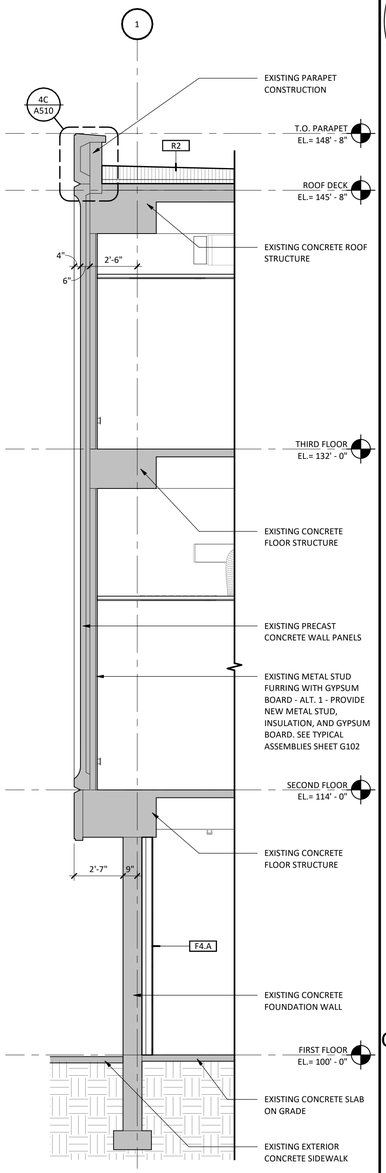

1A A501 TYP. WALL SECTION
SCALE: 1/4" = 1'-0"

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PHASE
CONSTRUCTION DOCUMENTS

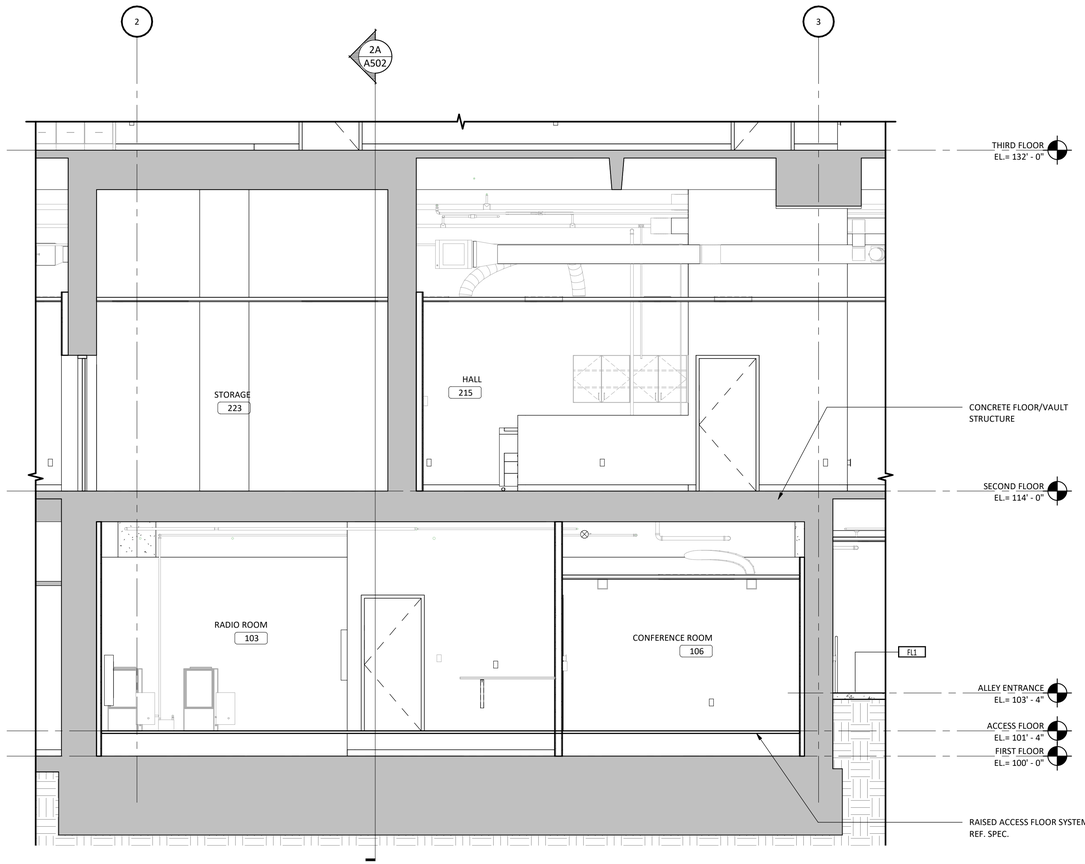
PROJECT
21019

SHEET
A501
WALL SECTIONS

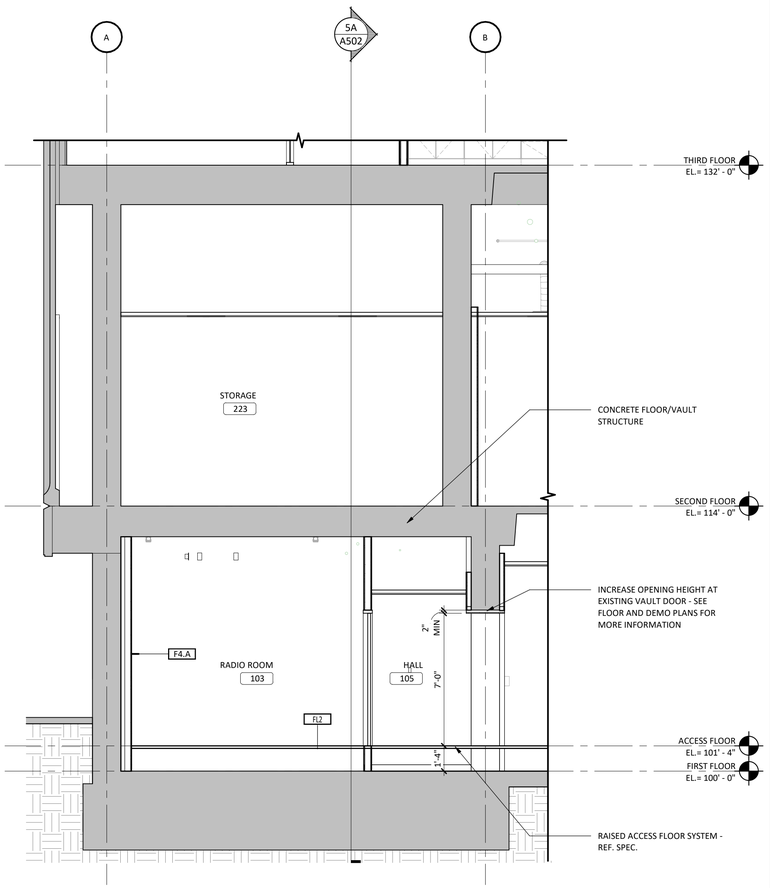
11/4/2021 10:13:27 AM

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION



5A / A502 VAULT SECTION 2
SCALE: 1/4" = 1'-0"



2A / A502 VAULT SECTION
SCALE: 1/4" = 1'-0"

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JENNIFER BURKE JACKSON
DATE 11 04 2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466

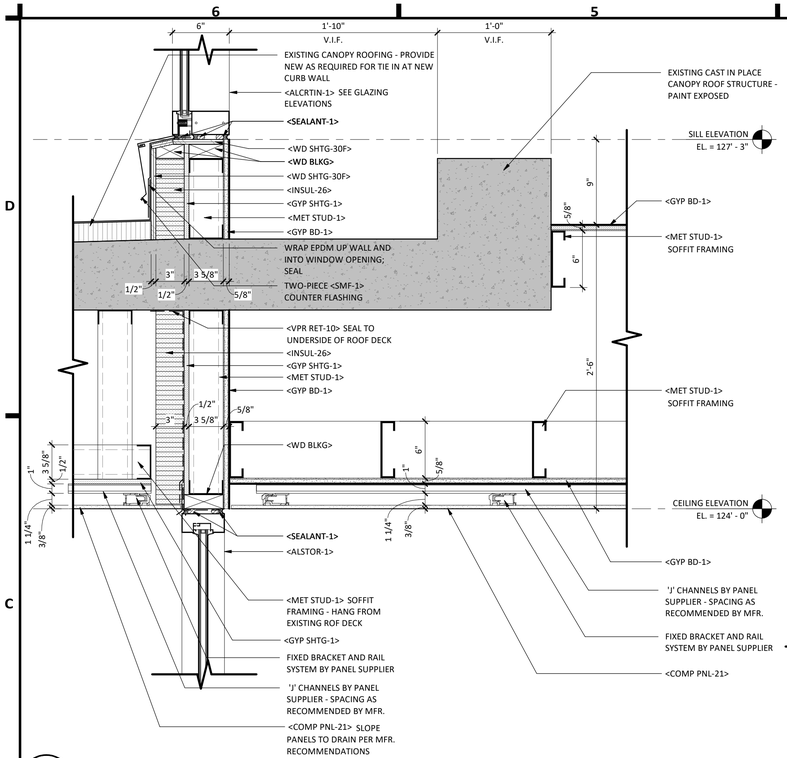
DATE
11/04/21

PHASE
CONSTRUCTION DOCUMENTS

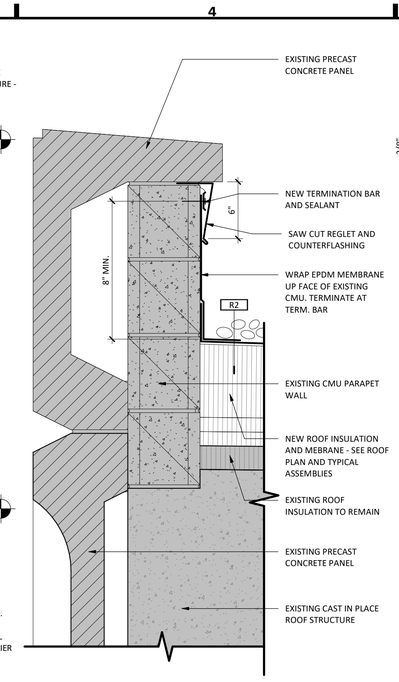
PROJECT
21019

SHEET
A502
WALL SECTIONS

11/4/2021 10:13:31 AM



6C A510 SF HEAD AT CANOPY - ALTERNATE 3
SCALE: 1 1/2" = 1'-0"



4C A510 PARAPET DETAIL
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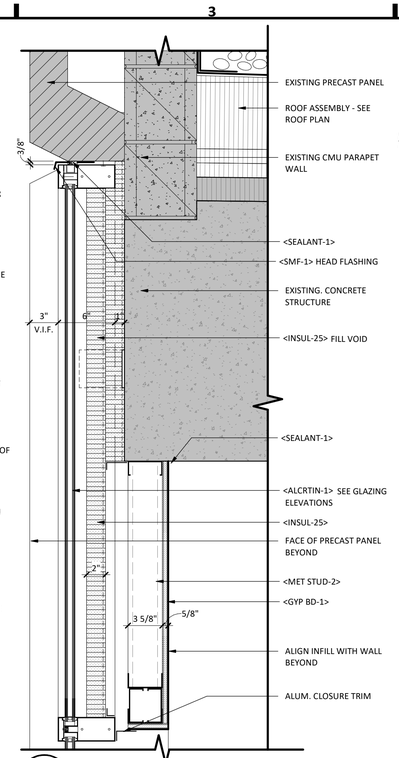

3C A510 CW1.4 HEAD (ALT. 4)
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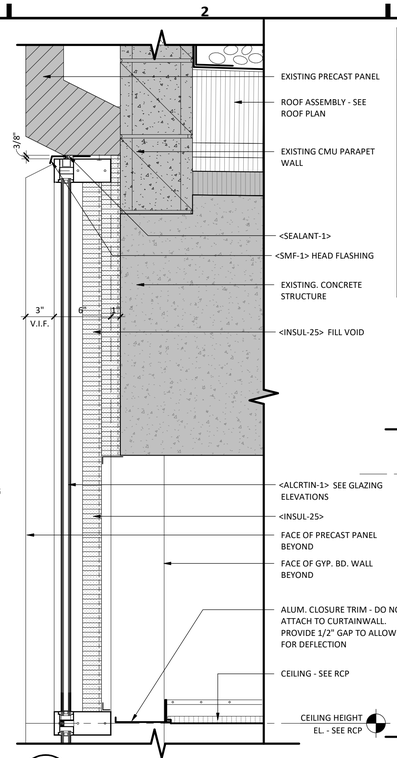
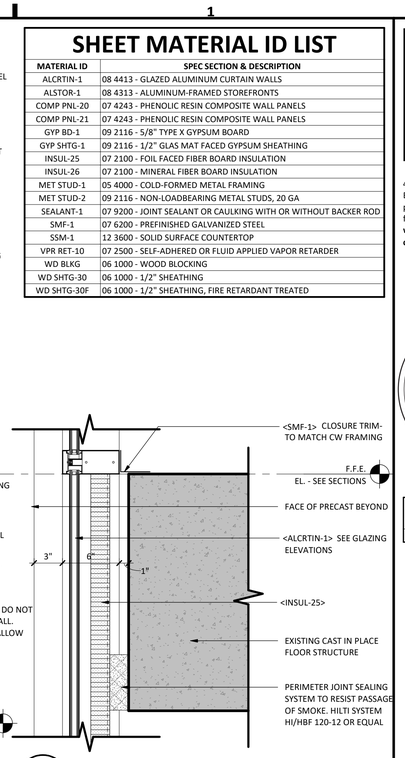


2C A510 CW HEAD AT PARAPET
SCALE: 1 1/2" = 1'-0"



1C A510 CW AT THIRD FLOOR
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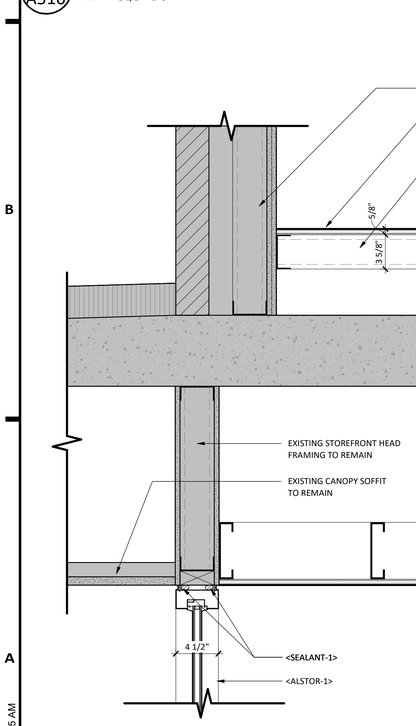
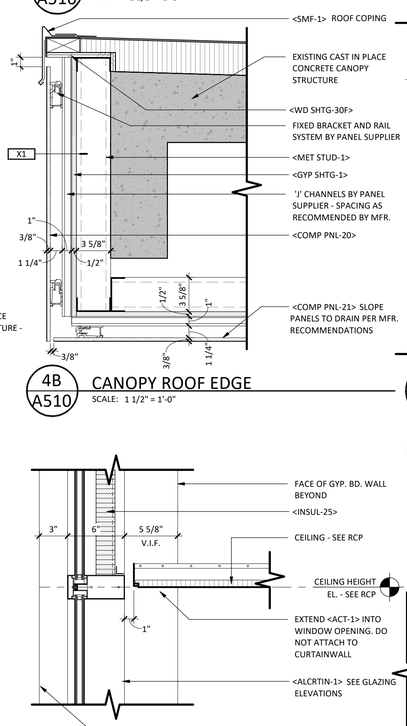


6A A510 SF HEAD AT CANOPY - ALTERNATE 2
SCALE: 1 1/2" = 1'-0"



4B A510 CANOPY ROOF EDGE
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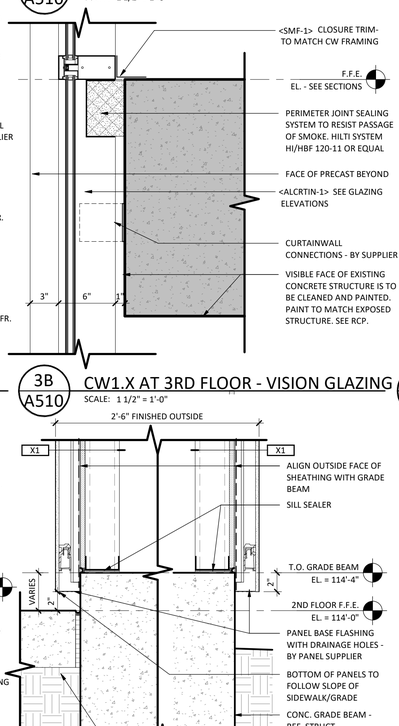

3B A510 CW1.X AT 3RD FLOOR - VISION GLAZING
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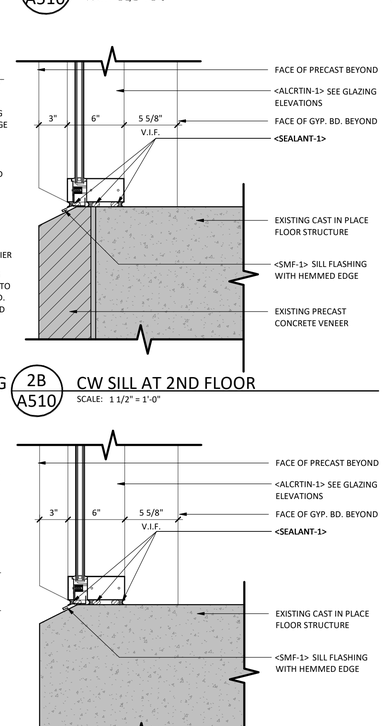
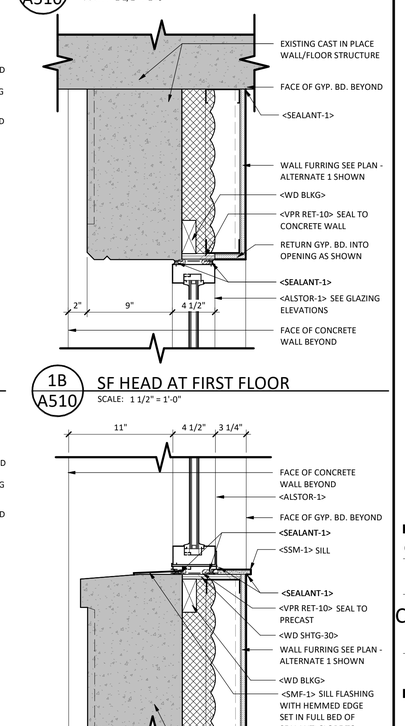
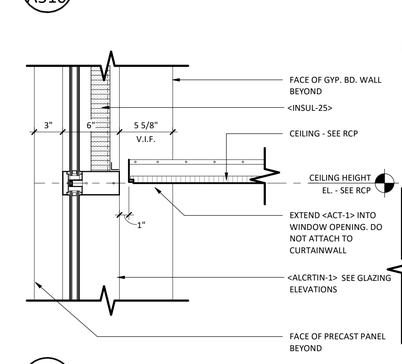


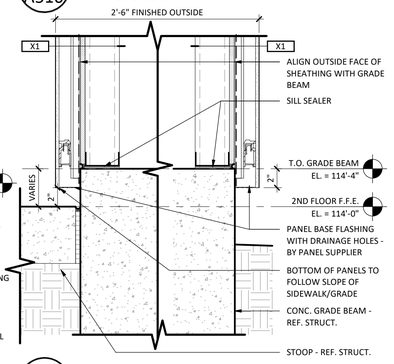
2B A510 CW SILL AT 2ND FLOOR
SCALE: 1 1/2" = 1'-0"



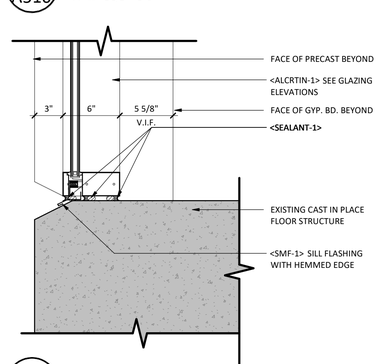
1B A510 SF HEAD AT FIRST FLOOR
SCALE: 1 1/2" = 1'-0"



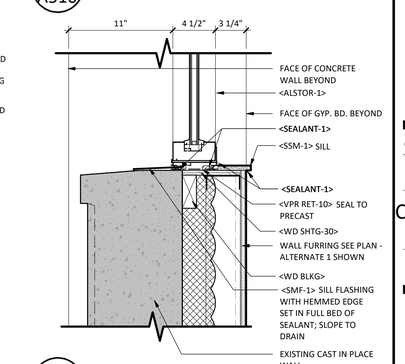
4A A510 CW1.X MULLION AT CEILING
SCALE: 1 1/2" = 1'-0"



3A A510 X1 WALL BASE (ALT. 3)
SCALE: 1 1/2" = 1'-0"



2A A510 CW SILL AT GRADE
SCALE: 1 1/2" = 1'-0"



1A A510 SF SILL AT FIRST FLOOR
SCALE: 1 1/2" = 1'-0"

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION
ALCRTIN-1	08 4413 - GLAZED ALUMINUM CURTAIN WALLS
ALSTOR-1	08 4313 - ALUMINUM-FRAMED STOREFRONTS
COMP PNL-20	07 4243 - PHENOLIC RESIN COMPOSITE WALL PANELS
COMP PNL-21	07 4243 - PHENOLIC RESIN COMPOSITE WALL PANELS
GYP BD-1	09 2116 - 5/8" TYPE X GYPSUM BOARD
GYP SHTG-1	09 2116 - 1/2" GLAS MAT FACED GYPSUM SHEATHING
INSUL-25	07 2100 - FOIL FACED FIBER BOARD INSULATION
INSUL-26	07 2100 - MINERAL FIBER BOARD INSULATION
MET STUD-1	05 4000 - COLD-FORMED METAL FRAMING
MET STUD-2	09 2116 - NON-LOADBEARING METAL STUDS, 20 GA
SEALANT-1	07 9200 - JOINT SEALANT OR CAULKING WITH OR WITHOUT BACKER ROD
SMF-1	07 6200 - PREFINISHED GALVANIZED STEEL
SSM-1	12 3600 - SOLID SURFACE COUNTERTOP
VPR RET-10	07 2500 - SELF-ADHERED OR FLUID APPLIED VAPOR RETARDER
WD BLKG	06 1000 - WOOD BLOCKING
WD SHTG-30	06 1000 - 1/2" SHEATHING
WD SHTG-30F	06 1000 - 1/2" SHEATHING, FIRE RETARDANT TREATED

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
7369
DATE 11.04.2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE

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CITY OF MINOT
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MINOT, ND

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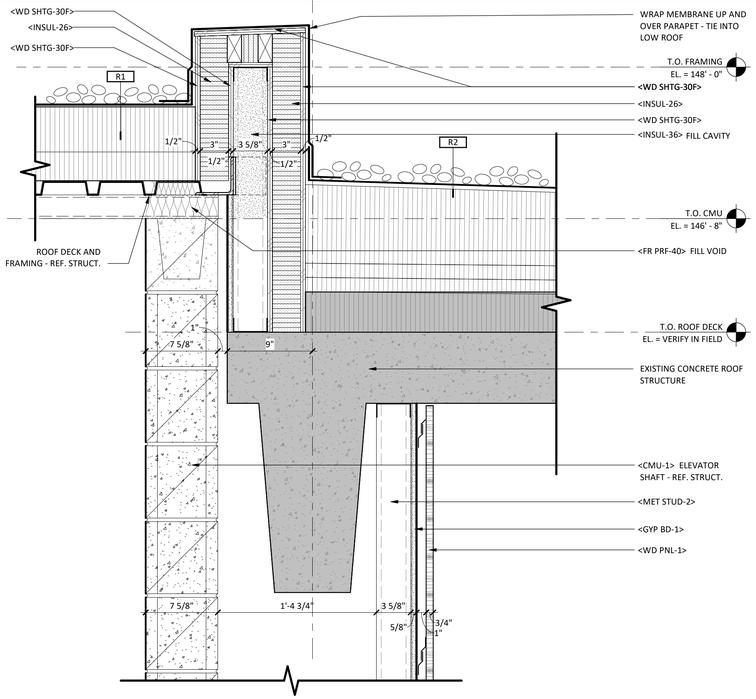
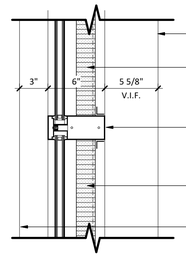
A510
EXTERIOR SECTION DETAILS

11/4/2021 10:13:35 AM

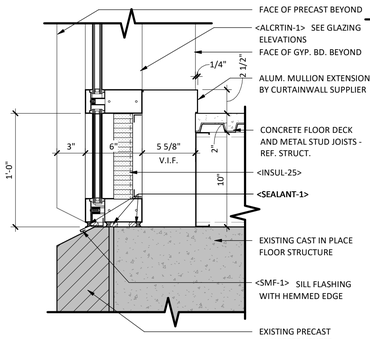


6C A511 ELEVATOR ROOF EDGE - EAST
SCALE: 1 1/2" = 1'-0"

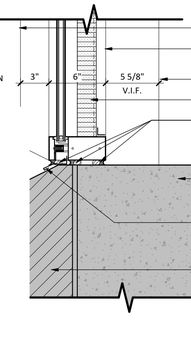


2D A511 CW1.X MULLION AT SPANDREL
SCALE: 1 1/2" = 1'-0"

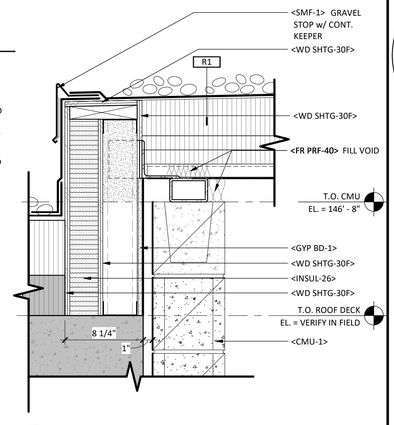
SHEET MATERIAL ID LIST	
MATERIAL ID	SPEC SECTION & DESCRIPTION
ALCRTIN-1	08 4413 - GLAZED ALUMINUM CURTAIN WALLS
CMU-1	04 2000 - STANDARD GREY CMU
FR PRF-40	07 8205 - BLANKET FIRE PROOFING
FUR-1	09 2116 - 7/8" DEEP HAT CHANNEL FURRING
FUR-2	09 2116 -ZEE FURRING
GYP BD-1	09 2116 - 5/8" TYPE X GYPSUM BOARD
INSUL-25	07 2100 - FOIL FACED FIBER BOARD INSULATION
INSUL-26	07 2100 - MINERAL FIBER BOARD INSULATION
INSUL-36	07 2119 - CLOSED CELL SPRAY FOAM INSULATION
MET STUD-2	09 2116 - NON-LOADBEARING METAL STUDS, 20 GA
SEALANT-1	07 9200 - JOINT SEALANT OR CAULKING WITH OR WITHOUT BACKER ROD
SMF-1	07 6200 - PREFINISHED GALVANIZED STEEL
WD BLKG	06 1000 - WOOD BLOCKING
WD PNL-1	09 5100 - WOOD WALL PANEL
WD SHTG-30F	06 1000 - 1/2" SHEATHING, FIRE RETARDANT TREATED



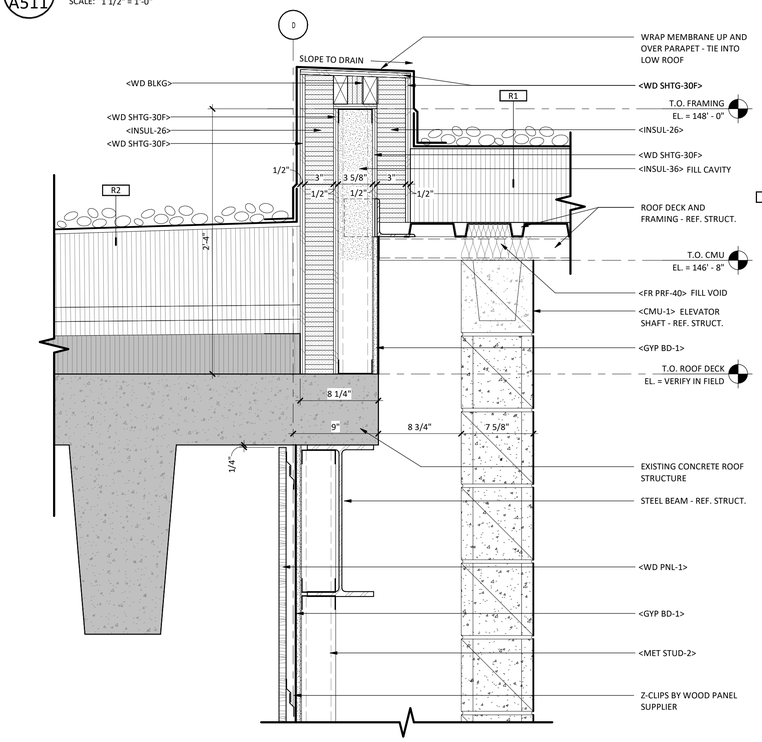
3C A511 CW SILL AT 2ND FLOOR - AT PLATFORM
SCALE: 1 1/2" = 1'-0"



2C A511 CW SILL AT 2ND FLOOR - SPANDREL
SCALE: 1 1/2" = 1'-0"



1C A511 ELEVATOR ROOF EDGE - NORTH
SCALE: 1 1/2" = 1'-0"



6A A511 ELEVATOR ROOF EDGE - WEST
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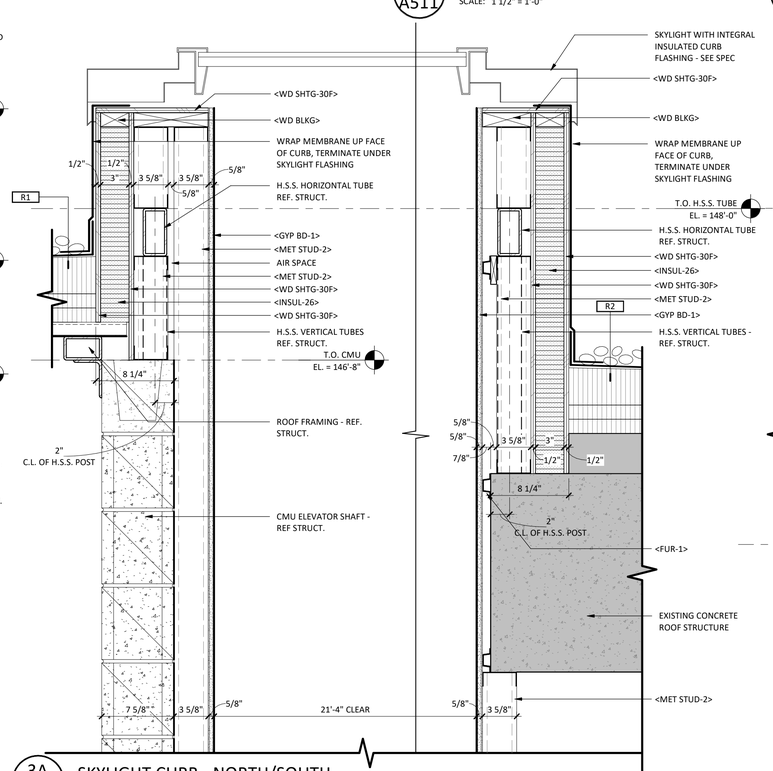
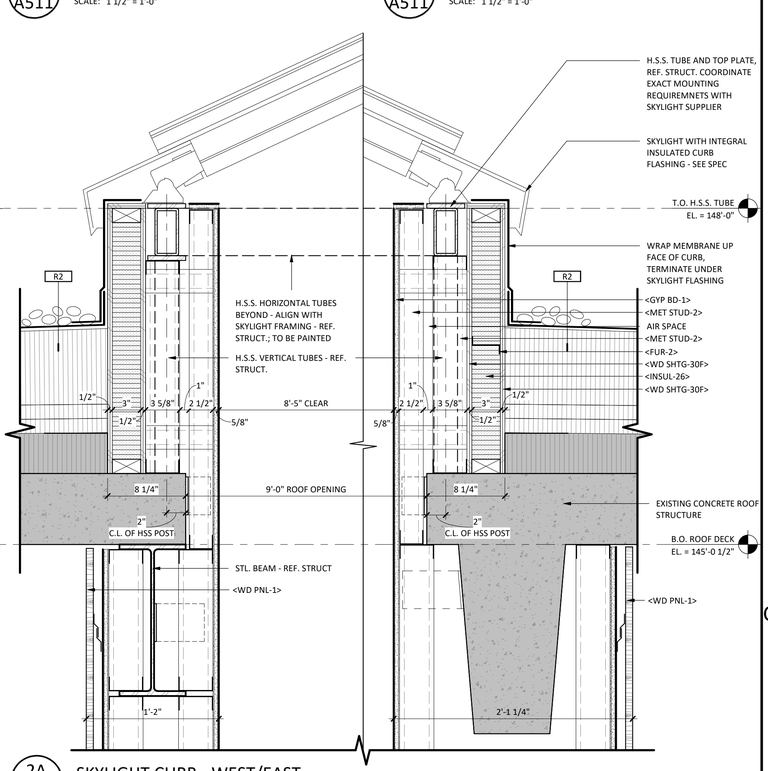


3A A511 SKYLIGHT CURB - NORTH/SOUTH
SCALE: 1 1/2" = 1'-0"



2A A511 SKYLIGHT CURB - WEST/EAST
SCALE: 1 1/2" = 1'-0"

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A511
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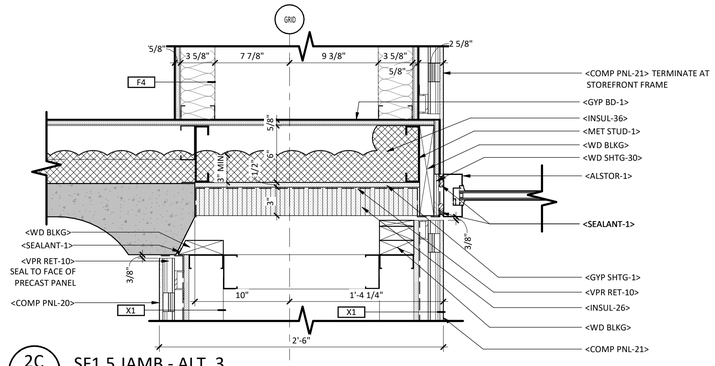
11/4/2021 10:13:40 AM

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION
ALCRTIN-1	08 4413 - GLAZED ALUMINUM CURTAIN WALLS
ALSTOR-1	08 4313 - ALUMINUM-FRAMED STOREFRONTS
COMP PNL-20	07 4243 - PHENOLIC RESIN COMPOSITE WALL PANELS
COMP PNL-21	07 4243 - PHENOLIC RESIN COMPOSITE WALL PANELS
GYP BD-1	09 2116 - 5/8" TYPE X GYPSUM BOARD
GYP SHTG-1	09 2116 - 1/2" GLAS MAT FACED GYPSUM SHEATHING
INSUL-26	07 2100 - MINERAL FIBER BOARD INSULATION
INSUL-36	07 2119 - CLOSED CELL SPRAY FOAM INSULATION
MET STUD-1	05 4000 - COLD-FORMED METAL FRAMING
SEALANT-1	07 9200 - JOINT SEALANT OR CAULKING WITH OR WITHOUT BACKER ROD
SMF-1	07 6200 - PREFINISHED GALVANIZED STEEL
VPR RET-10	07 2500 - SELF-ADHERED OR FLUID APPLIED VAPOR RETARDER
WD BLKG	06 1000 - WOOD BLOCKING
WD SHTG-30	06 1000 - 1/2" SHEATHING



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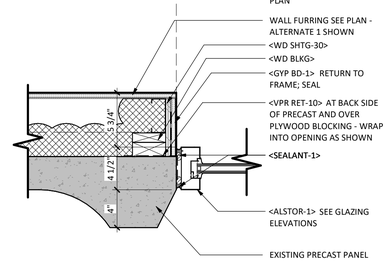

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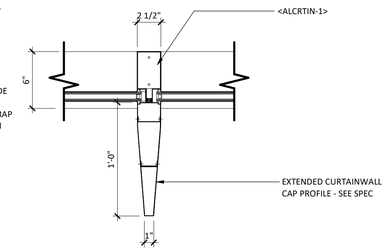

3B A515 CW1.4 TYP. VERTICAL MULLION (ALT. 4)
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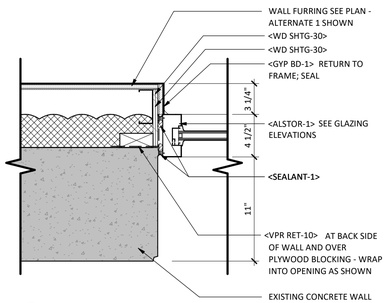
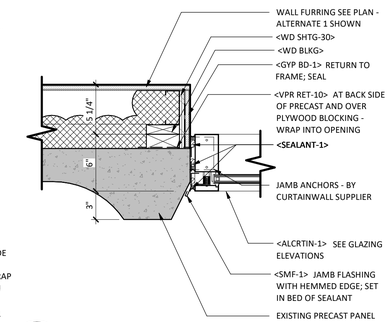
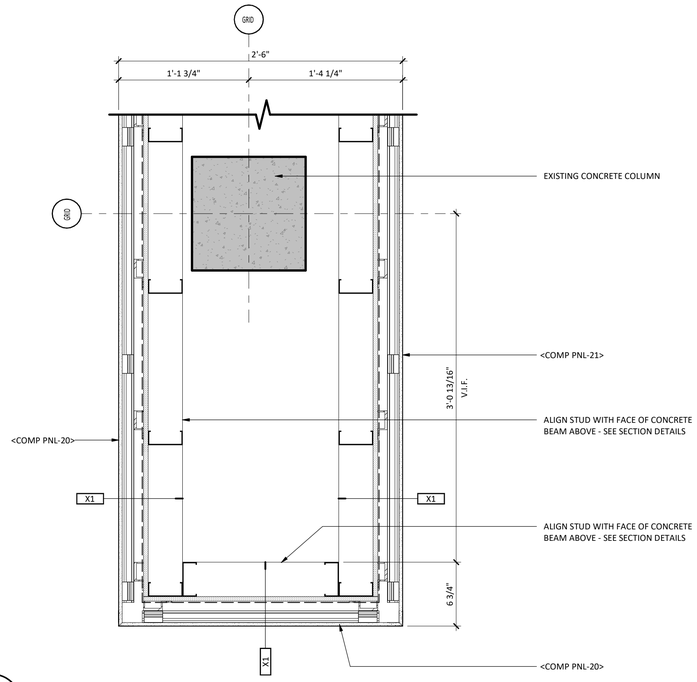


4A A515 SF1.X JAMB AT 1ST FLOOR
SCALE: 1 1/2" = 1'-0"



3A A515 CW1.X JAMB
SCALE: 1 1/2" = 1'-0"



2A A515 CANOPY COLUMN PLAN DETAIL
SCALE: 1 1/2" = 1'-0"

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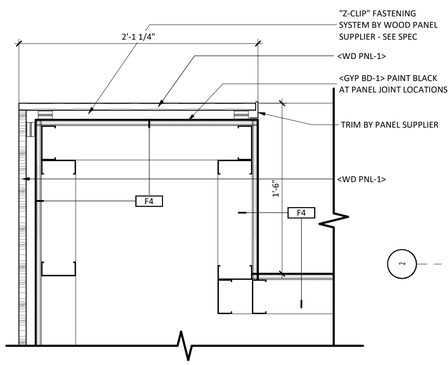
EXTERIOR PLAN DETAILS

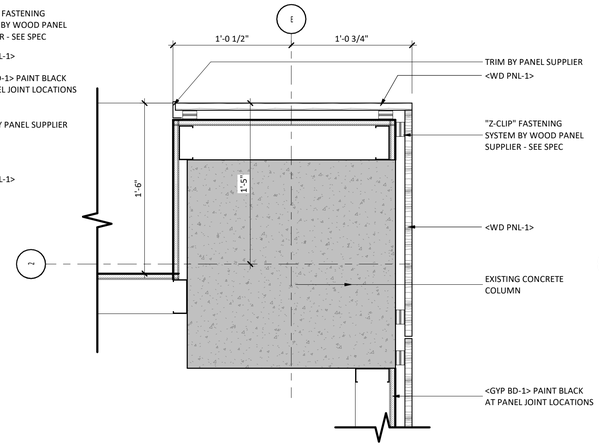
11/4/2021 10:13:43 AM

SHEET MATERIAL ID LIST

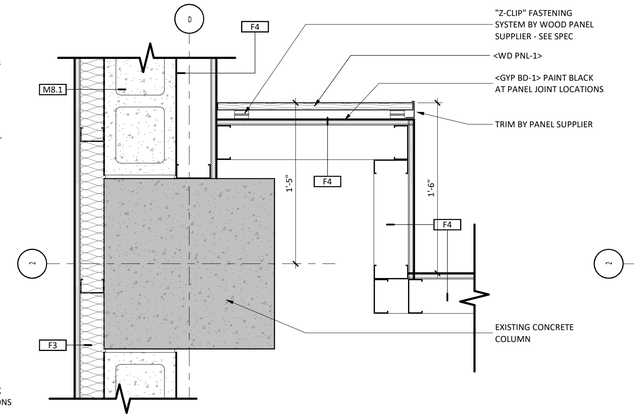
MATERIAL ID	SPEC SECTION & DESCRIPTION
WD BLKG	06 1000 - WOOD BLOCKING
WD PNL-1	09 5100 - WOOD WALL PANEL
WD SHTG-30F	06 1000 - 1/2" SHEATHING, FIRE RETARDANT TREATED



6C A520 CENTRAL STAIR - NW CORNER
SCALE: 1 1/2" = 1'-0"



5C A520 CENTRAL STAIR - NE CORNER
SCALE: 1 1/2" = 1'-0"



3C A520 CENTRAL STAIR - NW CORNER LVL 1
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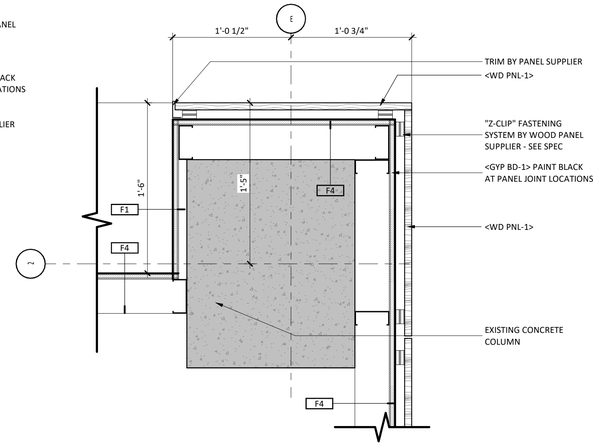
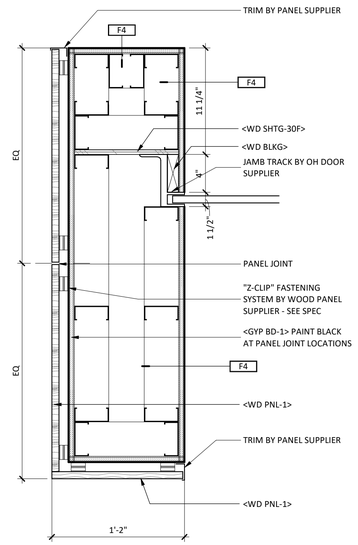
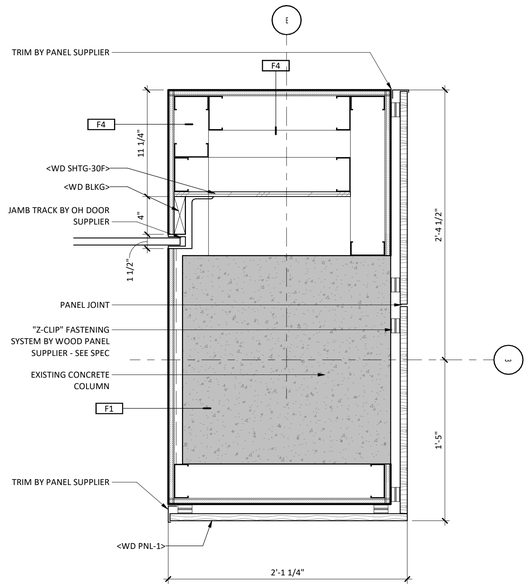


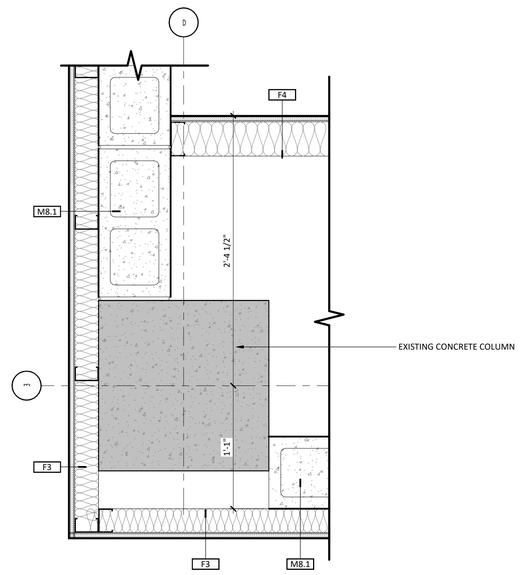
2C A520 CENTRAL STAIR - NE CORNER LVL 1
SCALE: 1 1/2" = 1'-0"



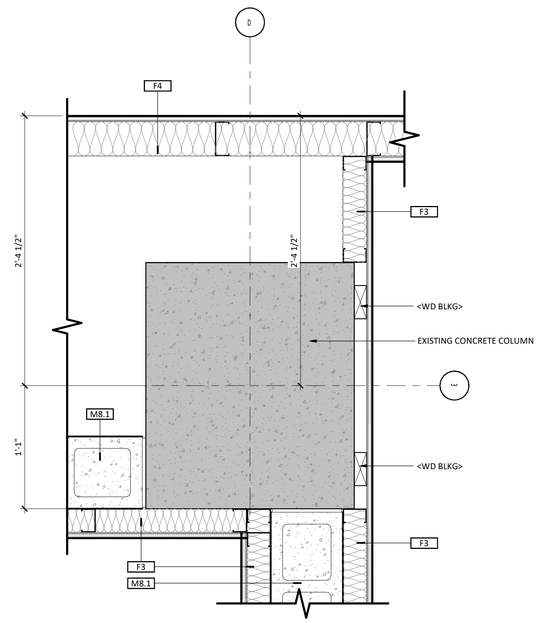
6A A520 CENTRAL STAIR - SW CORNER
SCALE: 1 1/2" = 1'-0"



5A A520 CENTRAL STAIR - SE CORNER
SCALE: 1 1/2" = 1'-0"



3A A520 CENTRAL STAIR - SW CORNER LVL 1
SCALE: 1 1/2" = 1'-0"



2A A520 CENTRAL STAIR - SE CORNER LVL 1
SCALE: 1 1/2" = 1'-0"

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CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE
11/04/21
PHASE
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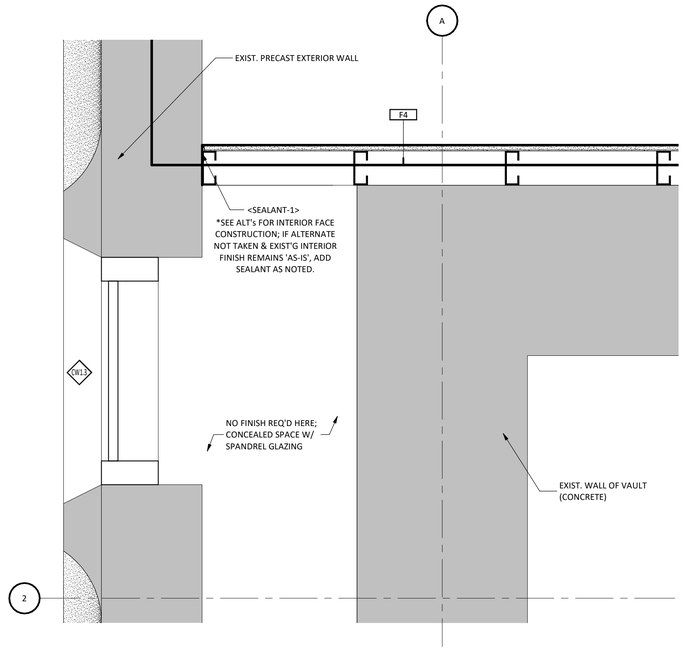
PROJECT
21019
SHEET
A520
INTERIOR PLAN DETAILS

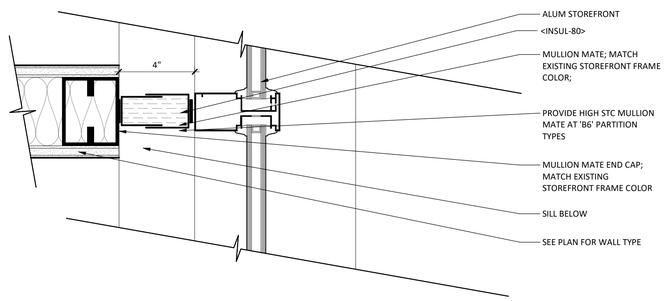
11/4/2021 10:13:46 AM

SHEET MATERIAL ID LIST

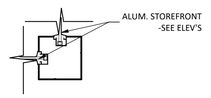
MATERIAL ID	SPEC SECTION & DESCRIPTION
CG-3	10 2600 - CORNER GUARD - STAINLESS STEEL
INSUL-80	09 2116 - ACOUSTIC INSULATION, MINERAL FIBER
SEALANT-1	07 9200 - JOINT SEALANT OR CAULKING WITH OR WITHOUT BACKER ROD



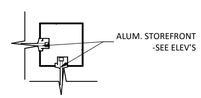
6C A521 LVL2 NW VAULT FURRING
SCALE: 1 1/2" = 1'-0"



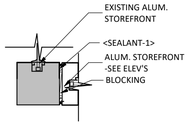
4D A521 SF AT WALL INTERSECT. PLAN DETAIL
SCALE: 3" = 1'-0"



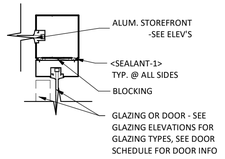
3D A521 SF CORNER DETAIL 2
SCALE: 1 1/2" = 1'-0"



2D A521 SF CORNER DETAIL 1
SCALE: 1 1/2" = 1'-0"



1D A521 EXT. STOREFRONT CORNER DETAIL
SCALE: 1 1/2" = 1'-0"



4C A521 SF2.31 JAMB DETAIL
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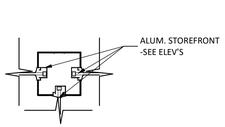
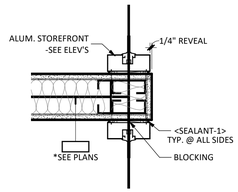
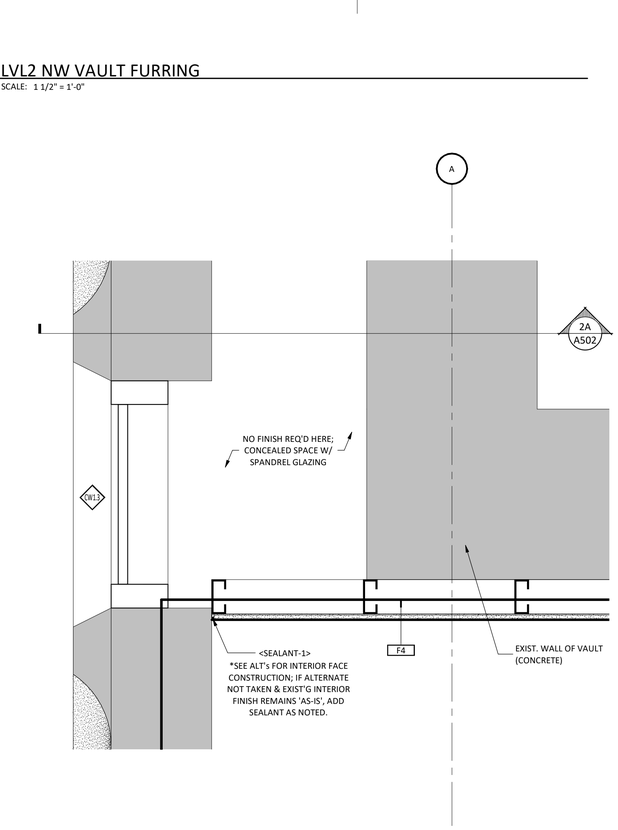


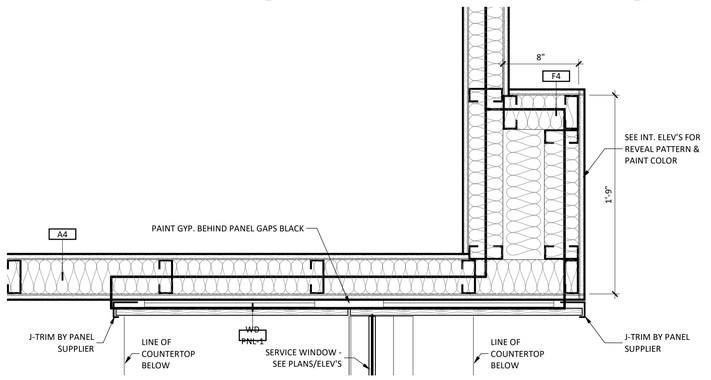
3C A521 SF2.6 JAMB DETAIL
SCALE: 1 1/2" = 1'-0"



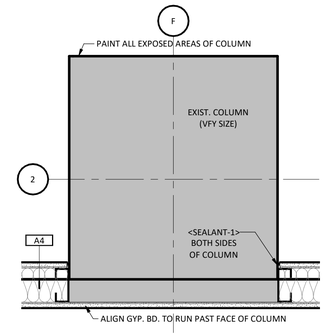
2C A521 STOREFRONT/WALL END CAP - TYPICAL
SCALE: 1 1/2" = 1'-0"



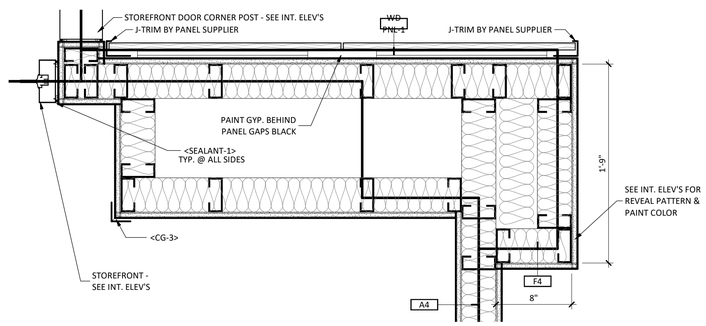
6A A521 LVL2 SW VAULT FURRING
SCALE: 1 1/2" = 1'-0"



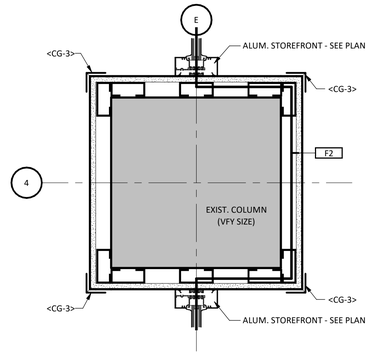
4B A521 PLAN DETAIL @ LVL2 WEST SERVICE COUNTER - NORTH
SCALE: 1 1/2" = 1'-0"



2B A521 1ST FLR EXP. COLUMN
SCALE: 1 1/2" = 1'-0"



4A A521 PLAN DETAIL @ LVL2 WEST SERVICE COUNTER - SOUTH
SCALE: 1 1/2" = 1'-0"



2A A521 ENTRY COLUMN WRAP
SCALE: 1 1/2" = 1'-0"

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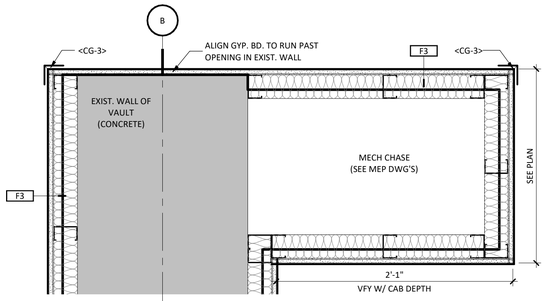
CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A521
INTERIOR PLAN DETAILS

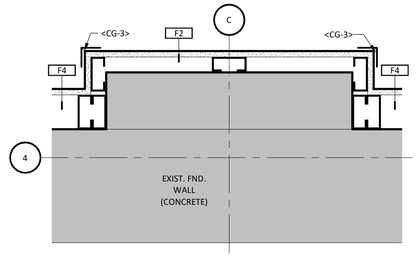
11/4/2021 10:13:53 AM

SHEET MATERIAL ID LIST

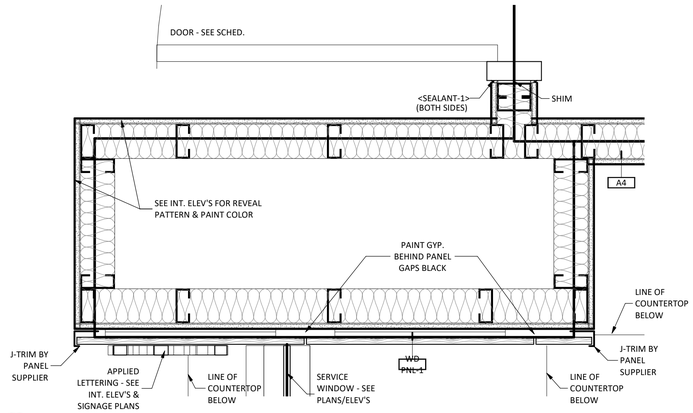
MATERIAL ID	SPEC SECTION & DESCRIPTION
ALSTOR-2	08 4313 - ALUMINUM-FRAMED STOREFRONTS
CG-3	10 2600 - CORNER GUARD - STAINLESS STEEL
SEALANT-1	07 9200 - JOINT SEALANT OR CAULKING WITH OR WITHOUT BACKER ROD



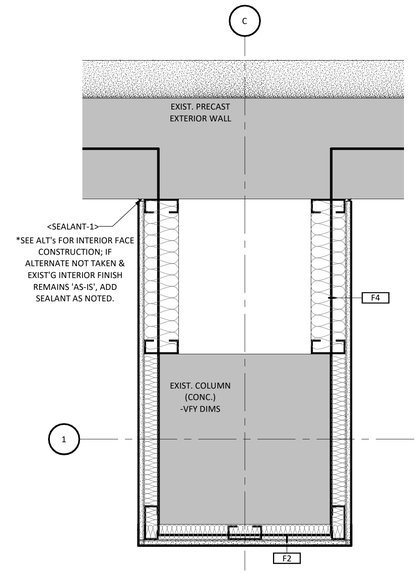
6D A522 CHASE @ VAULT
SCALE: 1 1/2" = 1'-0"



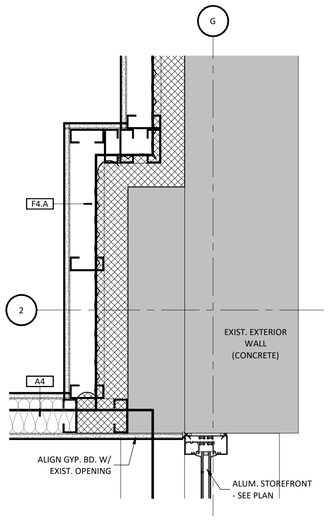
5D A522 PILASTER FURRING - NARROW
SCALE: 1 1/2" = 1'-0"



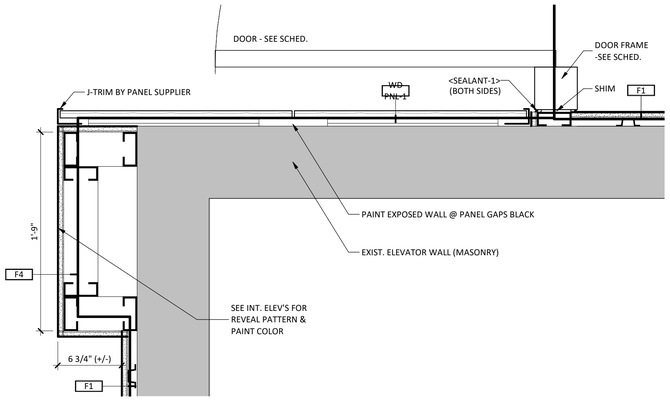
3C A522 PLAN DETAIL @ LVL2 EAST SERVICE COUNTER - NORTH
SCALE: 1 1/2" = 1'-0"



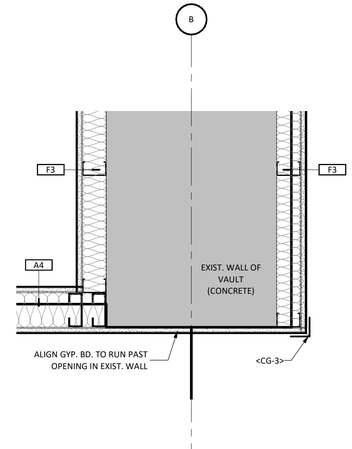
6B A522 COLUMN FURRING - TYPICAL
SCALE: 1 1/2" = 1'-0"



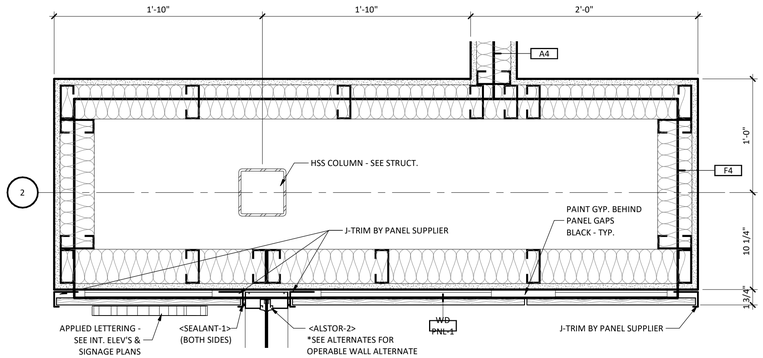
5B A522 PILASTER FURRING - STANDARD
SCALE: 1 1/2" = 1'-0"



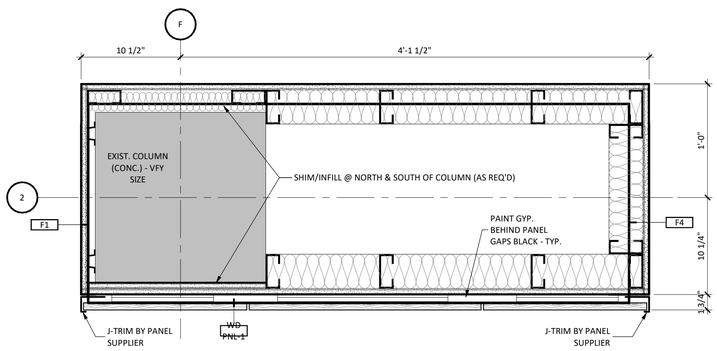
4B A522 PLAN DETAIL @ LVL2 EAST SERVICE COUNTER - SOUTH
SCALE: 1 1/2" = 1'-0"



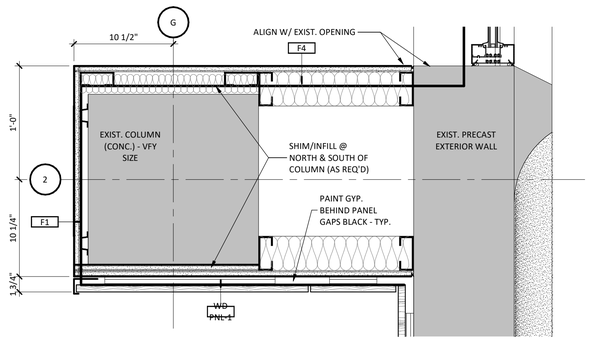
2B A522 FURRING DETAIL AT VAULT OPENING
SCALE: 1 1/2" = 1'-0"



6A A522 CHAMBER WINDOW WALL COLUMN FURRING
SCALE: 1 1/2" = 1'-0"



4A A522 CHAMBER EXIST'G COLUMN FURRING
SCALE: 1 1/2" = 1'-0"



2A A522 CHAMBER EXTERIOR EXIST'G COLUMN FURRING
SCALE: 1 1/2" = 1'-0"

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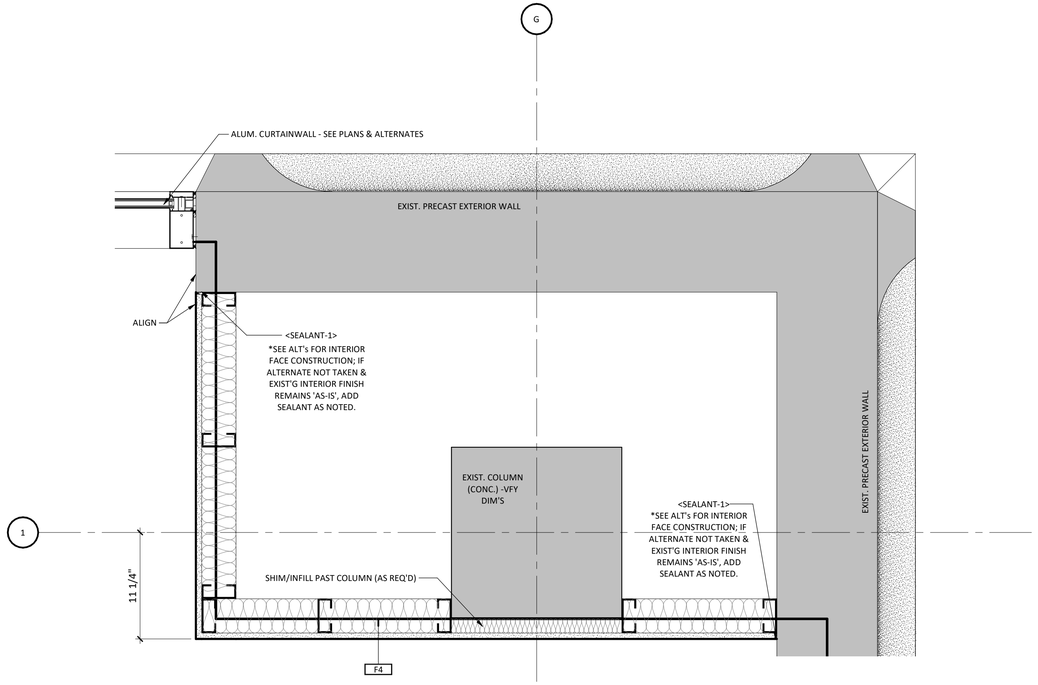
PROJECT 21019

SHEET **A522**
INTERIOR PLAN DETAILS

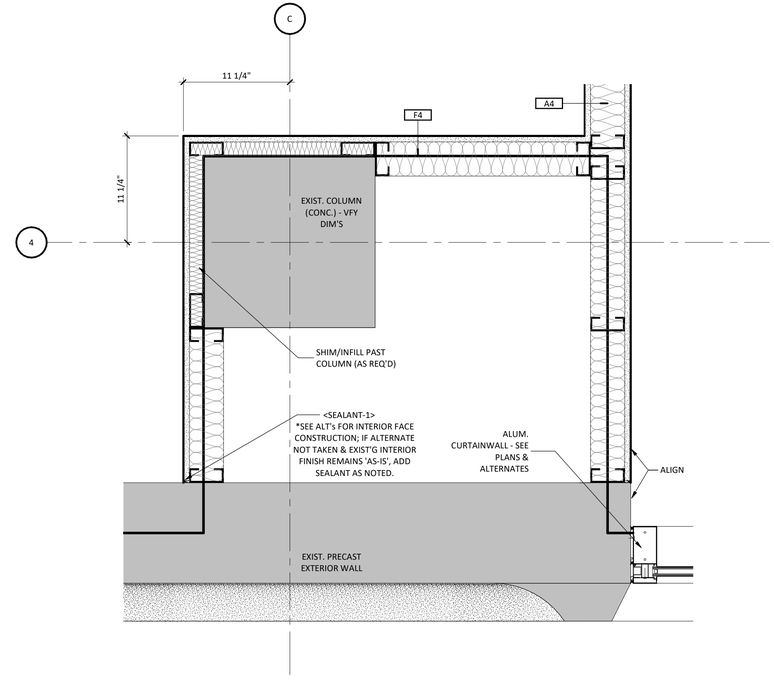
11/4/2021 10:14:00 AM

SHEET MATERIAL ID LIST

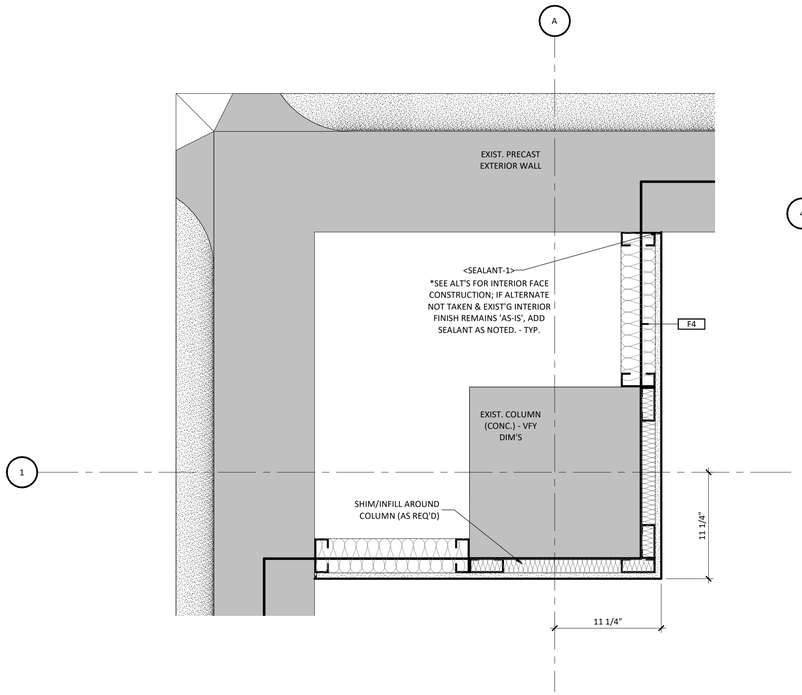
MATERIAL ID	SPEC SECTION & DESCRIPTION
SEALANT-1	07 9200 - JOINT SEALANT OR CAULKING WITH OR WITHOUT BACKER ROD



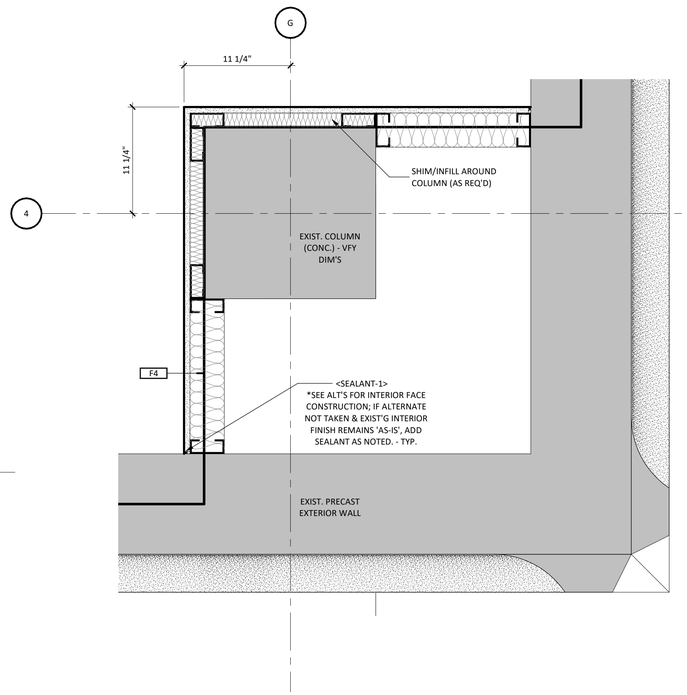
6C A523 NE CORNER COLUMN FURRING
SCALE: 1 1/2" = 1'-0"



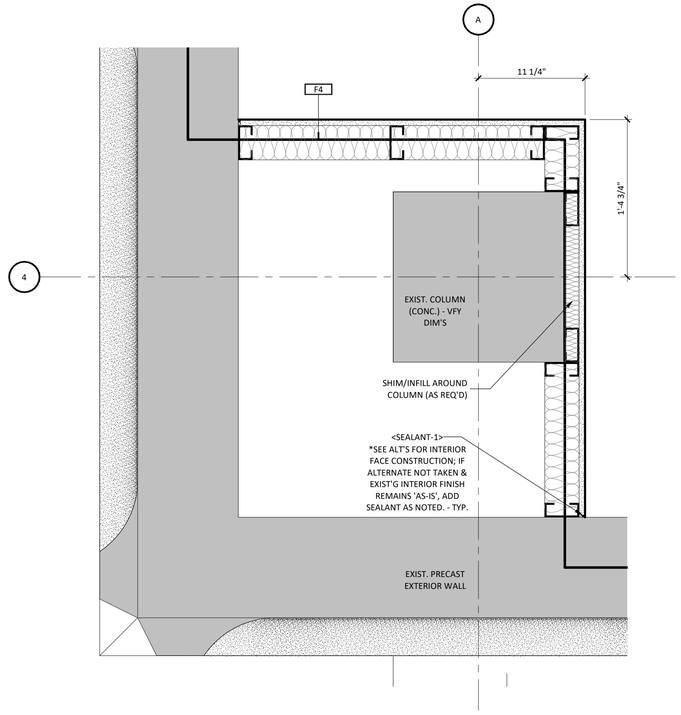
4C A523 SR ACT. 211 - COLUMN FURRING DETAIL
SCALE: 1 1/2" = 1'-0"



6A A523 NW CORNER COLUMN FURRING
SCALE: 1 1/2" = 1'-0"



4A A523 SE CORNER COLUMN FURRING
SCALE: 1 1/2" = 1'-0"



2A A523 SW CORNER COLUMN FURRING
SCALE: 1 1/2" = 1'-0"

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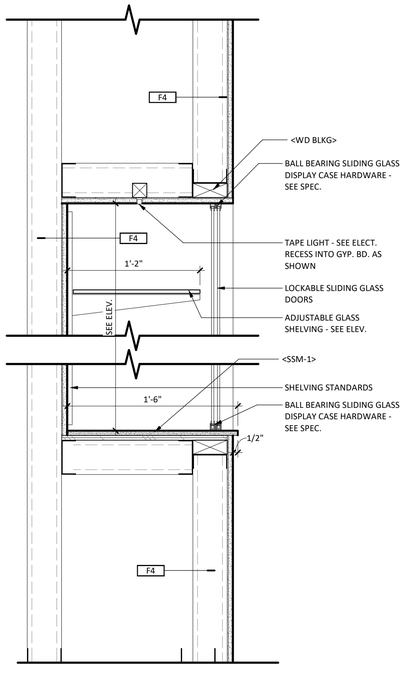
SHEET
A523
INTERIOR PLAN DETAILS

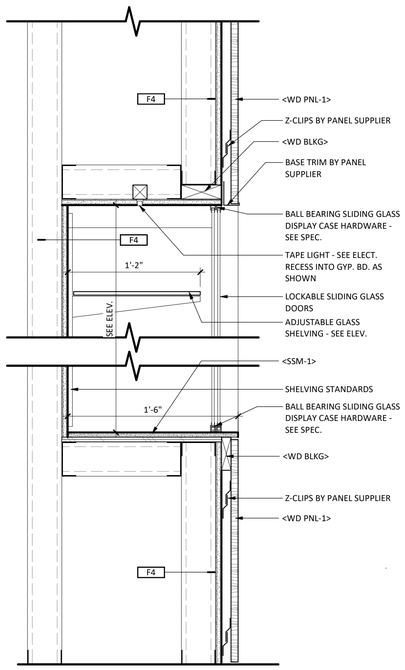
11/4/2021 10:14:06 AM

SHEET MATERIAL ID LIST

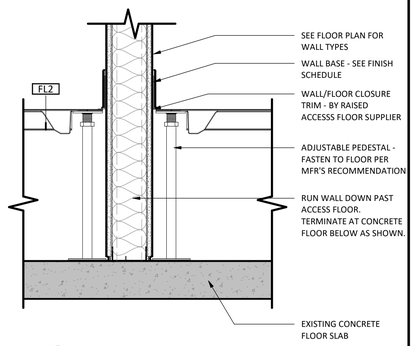
MATERIAL ID	SPEC SECTION & DESCRIPTION
GYP BD-16	09 2116 - 5/8" GLASS MAT FACED TILE BACKER BOARD
SSM-1	12 3600 - SOLID SURFACE COUNTERTOP
WD BLKG	06 1000 - WOOD BLOCKING
WD PNL-1	09 5100 - WOOD WALL PANEL



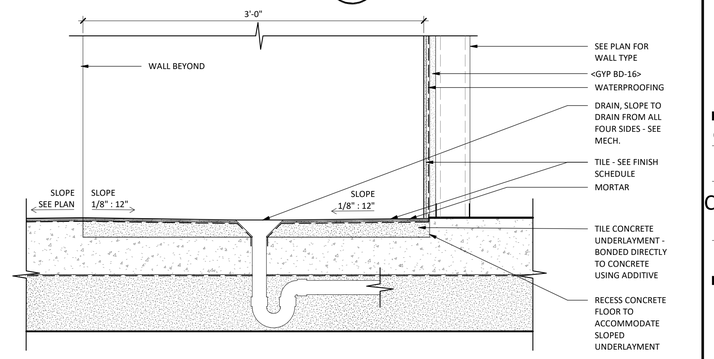
3C A524 DISPLAY CASE
SCALE: 1 1/2" = 1'-0"



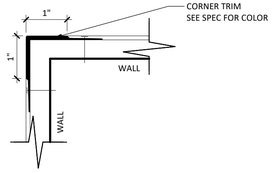
3A A524 DISPLAY CASE AT CENTRAL CORE
SCALE: 1 1/2" = 1'-0"



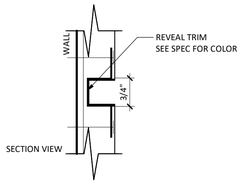
1B A524 ACCESS FLOOR AT WALL
SCALE: 1 1/2" = 1'-0"



1A A524 SHOWER FLOOR DETAIL
SCALE: 1 1/2" = 1'-0"



6A A524 CORNER TRIM DETAIL
SCALE: 6" = 1'-0"



5A A524 TYP. REVEAL
SCALE: 6" = 1'-0"

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A524
INTERIOR DETAILS

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ROOM FINISH SCHEDULE

ROOM NUMBER	ROOM NAME	BASE	FLOOR	WALLS				REMARKS
				NORTH	EAST	SOUTH	WEST	
FIRST FLOOR								
100	VESTIBULE	RB-2	CPT-7	PT-1	PT-1	PT-1	PT-1	
101	LOBBY	RB-2	CPT-7	PT-1	PT-1	PT-1	PT-1	
102	EXISTING TENANT	-	-	-	-	-	-	1
123	HALL	RB-1	CPT-3	PT-1	PT-1	PT-1	PT-1	
124	STAIR	RB-1	RST-1, RBT-1	PT-1	PT-1	PT-1	PT-1	6
125	CUST.	RB-1	CSLR-1	PT-1	PT-1	PT-1	PT-1	
126	JAN.	RB-1	CSLR-1	PT-1	PT-1	PT-1	PT-1	7
127	BOILER	-	-	-	-	-	-	1
128	HALL	RB-2	CPT-3	PT-1	PT-1	PT-1	PT-1	
129	STAIR	-	T-3	PT-2	PT-2	PT-2	PT-2	3
131	MECH.	RB-1	CSLR-1	PT-1	PT-1	PT-1	PT-1	
132	MEETING	RB-1	CPT-3, 4, 6	PT-1/PT-6	PT-1	PT-1	PT-1/PT-6	
133	SERVER	RB-1	ESD-1	PT-1	PT-1	PT-1	PT-1	
134	OFFICE	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
135	OFFICE	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
136	OFFICE	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
137	OFFICE	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
138	OFFICE	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
139	OFFICE	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
141	OFFICE	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
142	STOR.	RB-1	CPT-6	PT-1	PT-1	PT-1	PT-1	
143	TLT.	MT-3/T-4	T-1, 2	T-4/PT-7	T-4/PT-7	PT-7	PT-7	
144	TLT.	MT-3/T-4	T-1, 2	PT-7	T-4/PT-7	T-4/PT-7	PT-7	
145	STAIR	RB-1	RST-1, RBT-1	PT-1	PT-1	PT-1	PT-1	6
146	JANITOR	-	-	-	-	-	-	1
147	STORAGE	RB-1	CSLR-1	PT-1	PT-1	PT-1	PT-1	
148	TENANT	RB-1	CPT-3, 4, 6	PT-1/PT-12	PT-1	PT-1	PT-1/PT-12	
149	SERVER	RB-1	ESD-1	PT-1	PT-1	PT-1	PT-1	
151	STORAGE	RB-1	CPT-6	PT-1	PT-1	PT-1	PT-1	
152	OFFICE	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-12	
153	OFFICE	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
154	OFFICE	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
ACCESS FLOOR								
103	RADIO ROOM	RB-1	ACCESS-FLOR-ESD	PT-1	PT-1	PT-1	PT-1	2
104	DISPATCH CONSOLES	RB-1	ACCESS-FLOR-CPT-2	PT-3	PT-1	PT-1	PT-1	2
105	HALL	RB-1	ACCESS-FLOR-CPT-2	PT-1	PT-1	PT-1	PT-1	2
106	CONFERENCE ROOM	RB-1	ACCESS-FLOR-CPT-2	PT-1	PT-1	PT-3	PT-1	2
115	ASSIST. PSAP MANAGER	RB-1	ACCESS-FLOR-CPT-1	PT-2	PT-2	PT-2	PT-2	2
116	STORAGE	RB-1	ACCESS-FLOR-CPT-1	PT-1	PT-1	PT-1	PT-1	2
117	DECOMPRESS	RB-1	ACCESS-FLOR-CPT-1	PT-2	PT-2	PT-2	PT-2	2
118	HALL	RB-1	ACCESS-FLOR-CPT-1	-	PT-3	-	PT-1	2
119	BREAKROOM	RB-1	ACCESS-FLOR-LVT	WC-5/PT-1	PT-1/T-9	PT-1/T-9	PT-1	2
121	PSAP MANAGER	RB-1	ACCESS-FLOR-CPT-1	PT-2	PT-2	PT-2	PT-2	2
122	HALL	RB-1	ACCESS-FLOR-CPT-1	PT-1/PT-3	PT-1	PT-1	PT-1	2
ALLEY ENTRANCE								
107	VESTIBULE	RB-1	CPT-7	PT-1	PT-1	PT-1	PT-1	
108	TLT.	MT-3	T-1, 2	T-4	T-4	T-4	T-4	
109	TLT./SHOWER	MT-3	T-1, 2, 10	T-4	T-4	T-4	T-4	4
110	LOCKERS	RB-1	CPT-7	PT-1	PT-1	PT-1	PT-1	
111	TRANSFORMER	-	-	-	-	-	-	
112	ELECT.	RB-1	CSLR-1	PT-1	PT-1	PT-1	PT-1	
113	HALL	RB-1	ACCESS-FLOR-CPT-1	-	PT-1	-	PT-1	
114	HALL	RB-1	CPT-7, ACCESS-FLOR-CPT-1	PT-1	PT-1	PT-1	PT-1	
SECOND FLOOR								
200	VEST.	RB-2	CPT-7	PT-1	PT-1	PT-1	PT-1	
201	LOBBY	RB-2	CPT-7/TERR-1, 2, 3, 4	-	PT-1, 2, 13	PT-1	PT-1, 2, 13	5
202	CORRIDOR	RB-2	TERR-1, 2, 3, 4	WC-3	PT-1, 13	-	PT-1, WD PNL-1	5
203	WAITING	RB-2	TERR-1, 2, 3, 4	WC-3	-	PT-1, WD PNL-1	-	5
204	HALL	RB-2	TERR-1, 2, 3, 4	WC-3	WD PNL-1	-	PT-1, T-4	5
204.A	HALL	MT-3/RB-2	T-1, 2	PT-1	PT-1	PT-1	T-1, 2	
205	SERVICE	RB-1	CPT-6	PT-1	PT-1	PT-1	PT-7	
206	A/P	RB-1	CPT-6	PT-1	PT-1	PT-1	PT-1	
207	MAIL	RB-1	LVT-1	PT-1	PT-1	PT-1	PT-1	
208	A/R	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
209	HALL	RB-1	CPT-3, 4, 6	PT-1	PT-1	PT-1	PT-1	
211	SR. ACT.	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
212	TREASURER	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
213	FINANCE DIRECTOR	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
214	COMPTROLLER	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
215	HALL	RB-1	CPT-3, 4, 6	PT-1	PT-1	PT-1	PT-1	
216	SR. ACT.	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
217	SR. ACT.	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
218	SR. ACT.	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
219	PRINT AREA	RB-1	LVT-1	PT-1	PT-7	PT-1	PT-1	
220	WOMEN	MT-3	T-1, 2	T-4	T-4	T-5, 6, 7, 8	T-4	
221	MEN	MT-3	T-1, 2	T-5, 6, 7, 8	T-4	T-4	T-4	
222	HALL	RB-1	CPT-3	PT-1	PT-7	-	PT-1	
223	STORAGE	RB-1	CPT-6	PT-1	PT-1	PT-1	PT-1	
224	STORAGE	RB-1	CPT-6	PT-1	PT-1	PT-1	PT-1	
225	FAM. TLT.	MT-3/T-4	T-1, 2	PT-7	PT-7	PT-7, T-4	PT-7, T-4	
226	MOTHERS	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
227	JAN.	RB-1	CSLR-1	PT-1	PT-1	PT-1	PT-1	

ROOM FINISH SCHEDULE

ROOM NUMBER	ROOM NAME	BASE	FLOOR	WALLS				REMARKS
				NORTH	EAST	SOUTH	WEST	
228	HALL	RB-1	CPT-3	PT-1	PT-1	PT-7	PT-1	
229	WORKSTATIONS	RB-1	CPT-3, 4, 6	PT-1	-	PT-1	PT-1	
231	BUSINESS ANALYST	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
232	AUDITOR	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
233	NDR GRANT MANAGER	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
234	NDR COORDINATOR	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
235	LARGE MEETING	RB-2	CPT-1, 2	PT-1	PT-1	PT-6	PT-1	5
236	JANITOR	-	-	-	-	-	-	1
237	MAYOR	RB-1	CPT-1	PT-2	PT-2	PT-2	WC-3	
238	P.I.O.	RB-1	CPT-6	PT-1	PT-1	PT-1	PT-1	
239	HALL	RB-2	TERR-1, 2, 3, 4	WC-3	PT-1	PT-1	-	
241	P.I.O. BROADCAST	RB-1	CPT-6	PT-1	PT-1	PT-1	PT-1	
242	COUNCIL CONFERENCE	RB-2	CPT-1, 2	PT-1	PT-1	PT-1	PT-4	5
243	STORAGE	RB-1	CPT-6	PT-1	PT-1	PT-1	PT-1	
244	OFFICE/ INTERVIEW	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
245	OFFICE	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
246	COUNCIL CHAMBERS	RB-2	CPT-1, 5, 6	WC-3	WDP-1, PT-6	WC-3	WDP-1, PT-6	5
247	A/V	RB-1	CPT-5	PT-2	PT-2	PT-2	PT-2	
248	SERVICE	RB-1	CPT-3	PT-9	PT-1	PT-1	PT-1	
249	HALL	RB-1	CPT-3	PT-1	-	PT-1	PT-1	
250	WORKSTATIONS	RB-1	CPT-3, 4, 6	PT-1, 9	PT-1	PT-1	PT-1	
251	ASSESSOR	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
252	ASSIST. ASSESSOR	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
253	MECH.	-	-	-	-	-	-	1
254	STAIR	RB-1	RST-1, RBT-1	PT-1	PT-1	PT-1	PT-1	6
255	STAIR	-	T-3	PT-2	PT-2	PT-2	PT-2	3
256	STAIR	-	RST-1, RBT-1	PT-1	PT-1	PT-1	PT-1	6
THIRD FLOOR								
300	LOBBY	RB-2	CPT-1, 2, T-1	-	WC-2, PT-1, T-4	PT-1	PT-1, 2, 13	5
301	CORRIDOR	RB-2	CPT-3	PT-1	WC-2, PT-1	-	WD PNL-1, PT-1	5
302	WAITING	RB-2	CPT-3, 4	PT-1	-	WD PNL-1, PT-1	-	5
303	HALL	RB-2	CPT-3	PT-1	WD PNL-1	-	PT-1, 2, 13	5
304	SECRETARY	RB-1	CPT-6	PT-1	PT-1	PT-1	PT-11	
305	LARGE MEETING ROOM	RB-2	CPT-1, 2	PT-1	PT-1	PT-1	PT-11	5
306	WAITING	RB-1	CPT-3, 4, 6	PT-11	PT-1	PT-1	PT-1	
307	CITY MANAGER	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
308	WORKSTATIONS	RB-1	CPT-6	PT-1	-	PT-1	PT-1	
309	CLERK	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
310	FLEX	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
311	HALL	MT-3/RB-2	T-1, 2	PT-1	PT-1	PT-1	T-1, 2	
312	PRINT/FILE	RB-1	LVT-1	PT-1	PT-1	PT-1	PT-1	
313	WOMEN	MT-3	T-1, 2	T-4	T-4	T-5, 6, 7	T-4	
314	MEN	MT-3	T-1, 2	T-5, 6, 7	T-4	T-4	T-4	
315	COMPUTER TRAINING	RB-1	CPT-1, 2	PT-1	PT-1	PT-1	PT-7	
316	HALL	RB-1	CPT-3, 4, 6	PT-1	PT-11	PT-11	PT-1	
317	ASSIST. CITY MGR.	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
318	CONTRACT ATTORNEY	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
319	ASSIST. CITY ATTORNEY	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
321	CITY ATTORNEY	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
322	WORKSTATIONS	RB-1	CPT-3	PT-1	PT-4	-	PT-1	
323	WAITING	RB-1	CPT-3, 4, 6	PT-1, 4	PT-1	PT-1	PT-1	
324	MEDIUM MEETING	RB-2	CPT-1, 2	PT-1	PT-8	PT-1	PT-1	5
325	SMALL MEETING	RB-2	CPT-1, 2	PT-1	PT-1	PT-1	PT-9	5
326	HALL	RB-2	CPT-3	PT-1	PT-1	PT-1	PT-1	
327	LUNCH ROOM	RB-1	LVT-1	PT-1	PT-1	PT-1, T-9	PT-1, WC-5	
328	MOTHERS	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
329	WAITING	RB-1	CPT-3, 4, 6	PT-10	PT-1	PT-1	PT-1	
330	STORAGE	RB-1	CPT-6	PT-1	PT-1	PT-1	PT-1	
331	CONFERENCE	RB-2	CPT-1, 2	PT-10	PT-1	PT-1	PT-1	5
332	OFFICE	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
333	OFFICE	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
334	OFFICE	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
335	OFFICE	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
336	OFFICE	RB-1	CPT-6	PT-2	PT-2	PT-2	PT-2	
337	MECH.	-	CSLR-1	-	-	-	-	1
338	EXISTING	-	-	-	-	-	-	1
339	EXISTING	-	-	-	-	-	-	1
341	EXISTING	-	-	-	-	-	-	1
342	EXISTING	-	-	-	-	-	-	1
343	EXISTING	-	-	-	-	-	-	1
344	EXISTING	-	-	-	-	-	-	1
345	EXISTING	-	-	-	-	-	-	1
346	EXISTING	-	-	-	-	-	-	1
347	MECH.	-	-	-	-	-	-	1
348	EXISTING	-	-	-	-	-	-	1
349	EXISTING	-	-	-	-	-	-	1
350	EXISTING	-	-	-	-	-	-	1
351	EXISTING	-	-	-	-	-	-	1
352	EXISTING	-	-	-	-	-	-	1
353	JAN.	-	-	-	-	-	-	1
368	STAIR	RB-1	RST-1, RBT-1	PT-1	PT-1	PT-1	PT-1	6
369	STAIR	RB-1	RST-1, RBT-1	PT-1	PT-1	PT-1	PT-1	6
370	STAIR	-	T-3	PT-2	PT-2	PT-2	PT-2	3

FINISH SCHEDULE GENERAL NOTES

A. PAINT EXPOSED STAIR STRINGERS AND STAIR STRUCTURE <PT-16>
B. DRY FALL PAINT: PAINT ALL EXPOSED CEILING STRUCTURE, INCLUDING STRUCTURAL, MECHANICAL AND ELECTRICAL COMPONENTS, INCLUDING, BUT NOT LIMITED TO: CONDUITS, JUNCTION BOXES, PIPES, SUPPORT WIRES/CABLES, UNI-STRUTS. ALL EXPOSED GALVANIZED SURFACES TO BE PAINTED TO MATCH CEILING COLOR U.N.O.
C. PAINT EXPOSED STEEL AND CONCRETE COLUMNS <PT-1>
D. REFERENCE FINISH PLAN FOR ADDITIONAL INFORMATION.
E. PROVIDE FRP AT ALL MOP SINKS LOCATIONS. TO BE PROVIDED 48" OUT FROM EITHER SIDE OF SINK, UP TO 48" A.F.F. SEE DETAIL ON SHEET G120
F. REFER TO REFLECTED CEILING PLANS FOR MORE INFORMATION

FINISH SCHEDULE REMARKS

1. EXISTING SPACE IS TO REMAIN. NO NEW FINISHES
2. RAISED ACCESS FLOOR SYSTEM - SEE SPEC
3. PAINT STAIR STRINGERS / METAL PT-16
4. EPOXY GROUT AT SHOWER TILE FLOORS AND WALLS
5. SEE FINISH PLAN FOR MORE WALL FINISH DETAIL
6. PAINT STAIR STRINGERS / METAL PT-14
7. PROVIDE FRP AT ALL MOP SINKS LOCATIONS. TO BE PROVIDED 48" OUT FROM EITHER SIDE OF SINK, UP TO 48" A.F.F. SEE DETAIL ON SHEET G120

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JENNIFER BURKE JACKSON
7369
DATE 11.04.2021
STATE OF NORTH DAKOTA

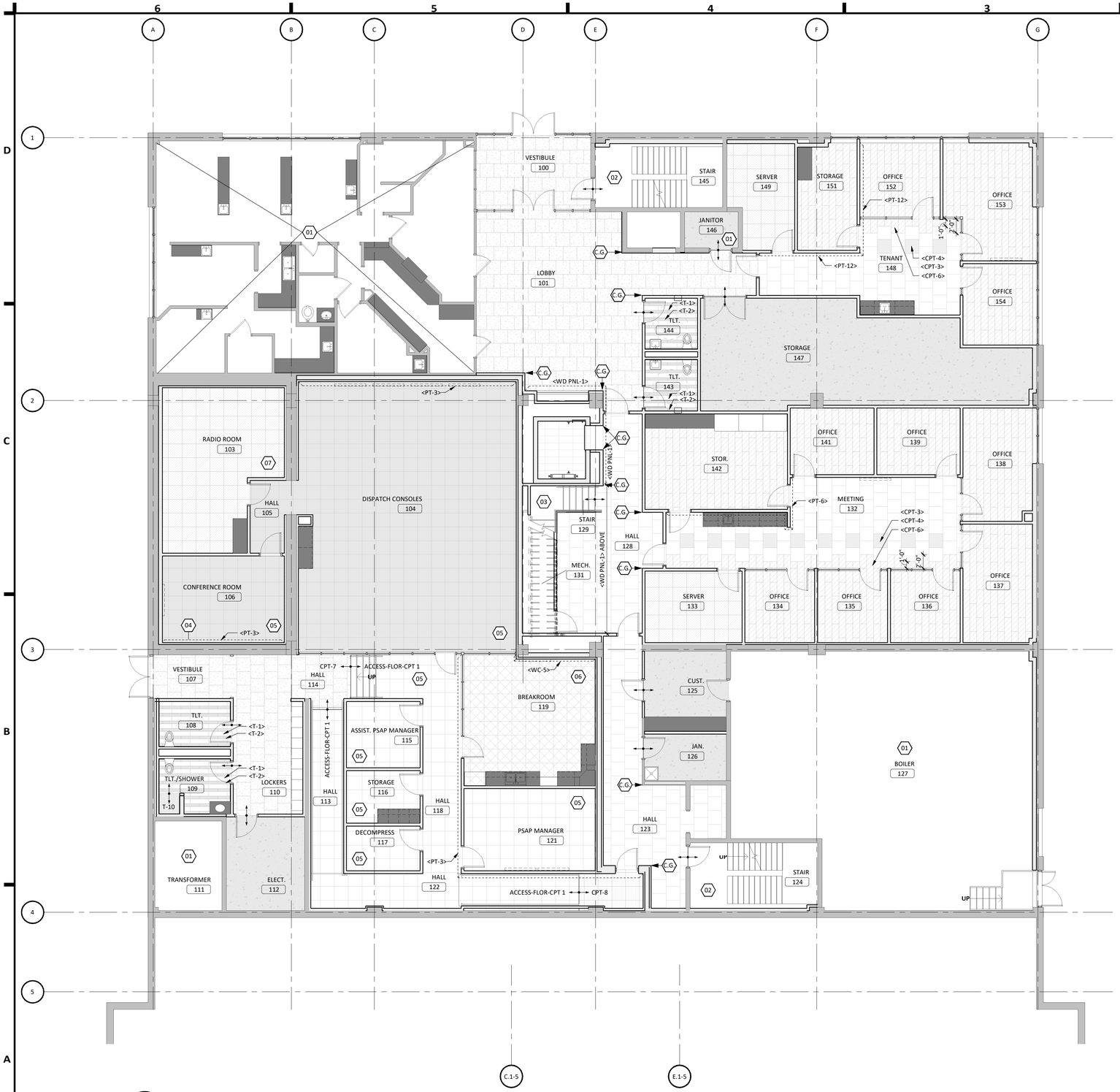
REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE
11/04/21
PHASE
CONSTRUCTION DOCUMENTS
PROJECT
21019
SHEET
A600
ROOM FINISH SCHEDULE

11/4/2021 10:14:12 AM



6A A601 FIRST FLOOR - FINISH PLAN
SCALE: 1/8" = 1'-0"

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION
CPT-3	09 6813 - TILE CARPETING
CPT-4	09 6813 - TILE CARPETING
CPT-6	09 6813 - TILE CARPETING
PT-3	09 9123 - PAINT
PT-6	09 9123 - PAINT
PT-12	09 9123 - PAINT
T-1	09 3000 - TILE
T-2	09 3000 - TILE
WC-5	09 7200 - WALL COVERINGS
WD PNL-1	09 5100 - WOOD WALL PANEL

FINISH PLAN GENERAL NOTES

1. PAINT ALL EXPOSED CMU AND GYPSUM BOARD UNLESS NOTED OTHERWISE.
2. PROVIDE LEVEL 5 DRYWALL FINISH AT ALL APPLIED WALL GRAPHICS LOCATIONS.
3. PAINT HORIZONTAL AND VERTICAL FACES OF ALL SOFFITS AND BULKHEADS.
4. PROVIDE APPROPRIATE FLOORING TRANSITION TYPE. CENTER UNDER DOOR U.N.O AT DOOR LOCATIONS.
5. REFERENCE SPECIFICATIONS FOR MATERIALS LISTED IN FINISH SCHEDULE.

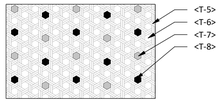
FLOOR LEGEND

- CPT-1
- CPT-2
- CPT-3
- CPT-4
- CPT-5
- CPT-6
- CPT-7
- CPT-8
- T-10
- LVT-1
- CSLR-1
- ACCESS-FLOR-CPT-1
- ACCESS-FLOR-CPT-2
- ACCESS-FLOR-ESD
- ACCESS-FLOR-LVT

FINISH PLAN KEYNOTES

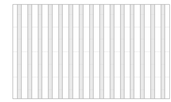
KEYNOTE	DESCRIPTION
01	EXISTING FINISHES TO REMAIN
02	EXISTING STAIR - PROVIDE NEW RUBBER TREADS/RISERS AND LANDINGS. PAINT WALLS, PROVIDE NEW CEILINGS. SEE RCP AND FINISH SCHEDULE FOR MORE INFORMATION
03	NEW STAIR - PROVIDE CERAMIC TILE AT TREADS/LANDINGS. SEE DETAILS
04	BID ALTERNATE #7 APPLIED CUSTOM VINYL SUPERGRAPHIC WALL COVERING. PROVIDE FROM TOP OF WALL OT CEILING ABOVE CUSTOM IMAGRY TO BE DEVELOPED WITH ARCHITECT PRIOR TO FABRICATION
05	ACCESS-FLOR-CPT - TO BE ORDERED WITH SPEC SECTION 09 6900
06	ACCESS-FLOR-LVT- TO BE ORDERED WITH SPEC SECTION 09 6900
07	ACCESS-FLOR-ESD - TO BE ORDERED WITH SPEC SECTION 09 6900
C.G.	CORNER GUARD - FULL HEIGHT FROM TOP OF WALL BASE TO CEILING ABOVE

TYPICAL HEX TILE DETAIL - RESTROOMS



2A A601 HEX WALL PATTERN
SCALE: 1/8" = 1'-0"

TYPICAL FLOOR TILE PATTERN - RESTROOMS



1A A601 TILE PATTERN
SCALE: 1/8" = 1'-0"

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LICENSED ARCHITECT JENNIFER BURKE JACKSON 7360 DATE 1 04 2021 STATE OF NORTH DAKOTA

REVISION SCHEDULE		
NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A601
FIRST FLOOR FINISH PLAN

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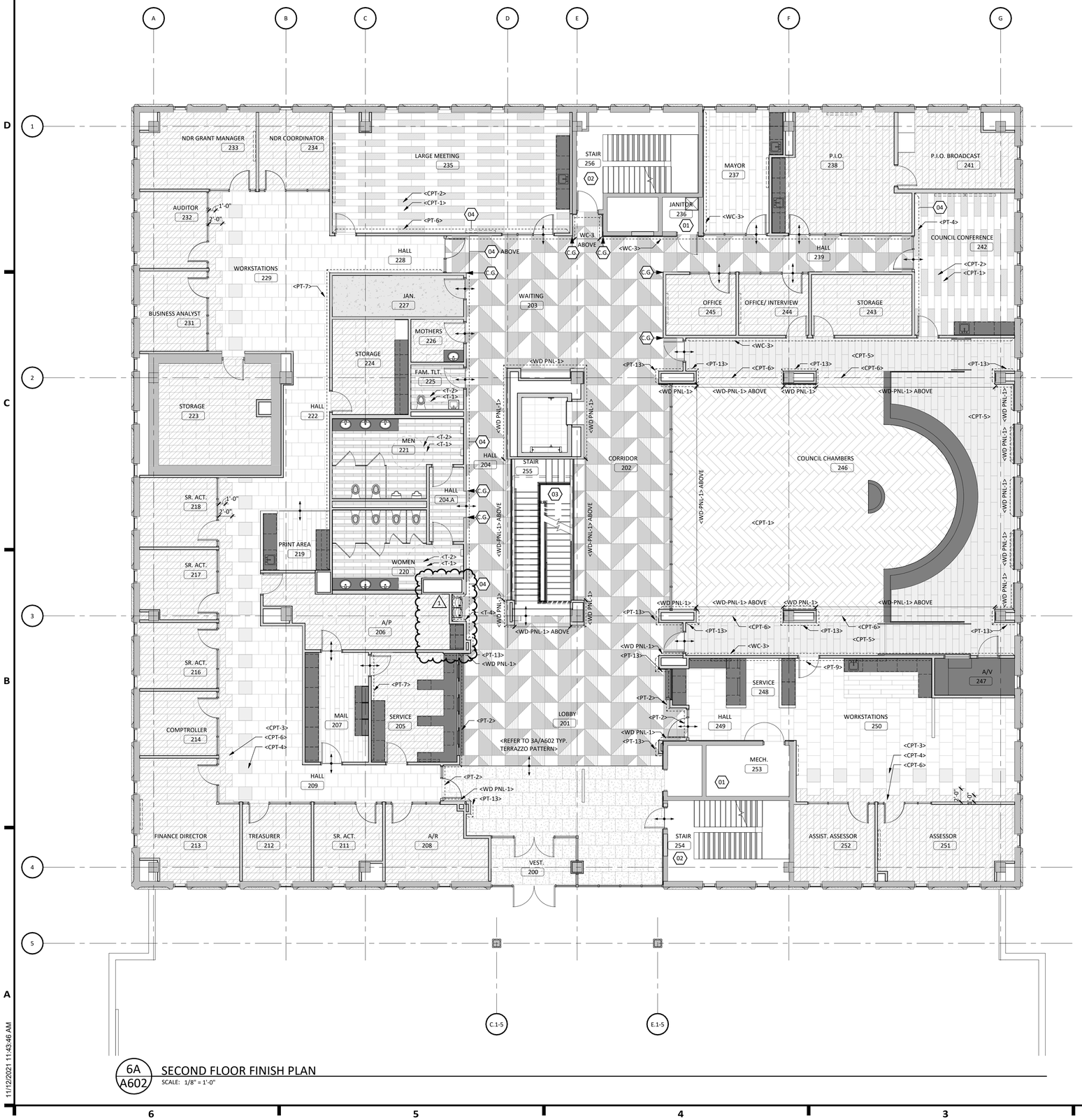


6A A602 SECOND FLOOR FINISH PLAN

SCALE: 1/8" = 1'-0"

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION
CPT-1	09 6813 - TILE CARPETING
CPT-2	09 6813 - TILE CARPETING
CPT-3	09 6813 - TILE CARPETING
CPT-4	09 6813 - TILE CARPETING
CPT-5	09 6813 - TILE CARPETING
CPT-6	09 6813 - TILE CARPETING
PT-2	09 9123 - PAINT
PT-4	09 9123 - PAINT
PT-6	09 9123 - PAINT
PT-7	09 9123 - PAINT
PT-9	09 9123 - PAINT
PT-13	09 9123 - PAINT
T-1	09 3000 - TILE
T-2	09 3000 - TILE
T-4	09 3000 - TILE
WC-3	09 7200 - WALL COVERINGS
WD PNL-1	09 5100 - WOOD WALL PANEL

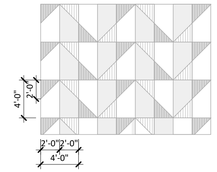
FINISH PLAN GENERAL NOTES

1. PAINT ALL EXPOSED CMU AND GYPSUM BOARD UNLESS NOTED OTHERWISE.
2. PROVIDE LEVEL 5 DRYWALL FINISH AT ALL APPLIED WALL GRAPHICS LOCATIONS.
3. PAINT HORIZONTAL AND VERTICAL FACES OF ALL SOFFITS AND BULKHEADS.
4. PROVIDE APPROPRIATE FLOORING TRANSITION TYPE. CENTER UNDER DOOR U.N.O AT DOOR LOCATIONS.
5. REFERENCE SPECIFICATIONS FOR MATERIALS LISTED IN FINISH SCHEDULE.

FLOOR LEGEND

- CPT-1
- CPT-2
- CPT-3
- CPT-4
- CPT-5
- CPT-6
- CPT-7
- CPT-8
- T-10
- LVT-1
- CSLR-1
- ACCESS-FLOR-CPT-1
- ACCESS-FLOR-CPT-2
- ACCESS-FLOR-ESD
- ACCESS-FLOR-LVT

TYPICAL TERRAZZO PATTERN



3A A602 TYPICAL TERRAZZO FLOORING

SCALE: 1/8" = 1'-0"

FINISH PLAN KEYNOTES

KEYNOTE	DESCRIPTION
01	EXISTING FINISHES TO REMAIN
02	EXISTING STAIR - PROVIDE NEW RUBBER TREADS/RISERS AND LANDINGS. PAINT WALLS, PROVIDE NEW CEILINGS. SEE RCP AND FINISH SCHEDULE FOR MORE INFORMATION
03	NEW STAIR - PROVIDE CERAMIC TILE AT TREADS/LANDINGS. SEE DETAILS
04	BID ALTERNATE #7 APPLIED CUSTOM VINYL SUPERGRAPHIC WALL COVERING. PROVIDE FROM TOP OF WALL OT CEILING ABOVE CUSTOM IMAGRY TO BE DEVELOPED WITH ARCHITECT PRIOR TO FABRICATION
05	ACCESS-FLOR-CPT - TO BE ORDERED WITH SPEC SECTION 09 6900
06	ACCESS-FLOR-LVT- TO BE ORDERED WITH SPEC SECTION 09 6900
07	ACCESS-FLOR-ESD - TO BE ORDERED WITH SPEC SECTION 09 6900
C.G.	CORNER GUARD - FULL HEIGHT FROM TOP OF WALL BASE TO CEILING ABOVE

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LICENSED ARCHITECT JENNIFER BURKE JACKSON DATE 1 04 2021 STATE OF NORTH DAKOTA

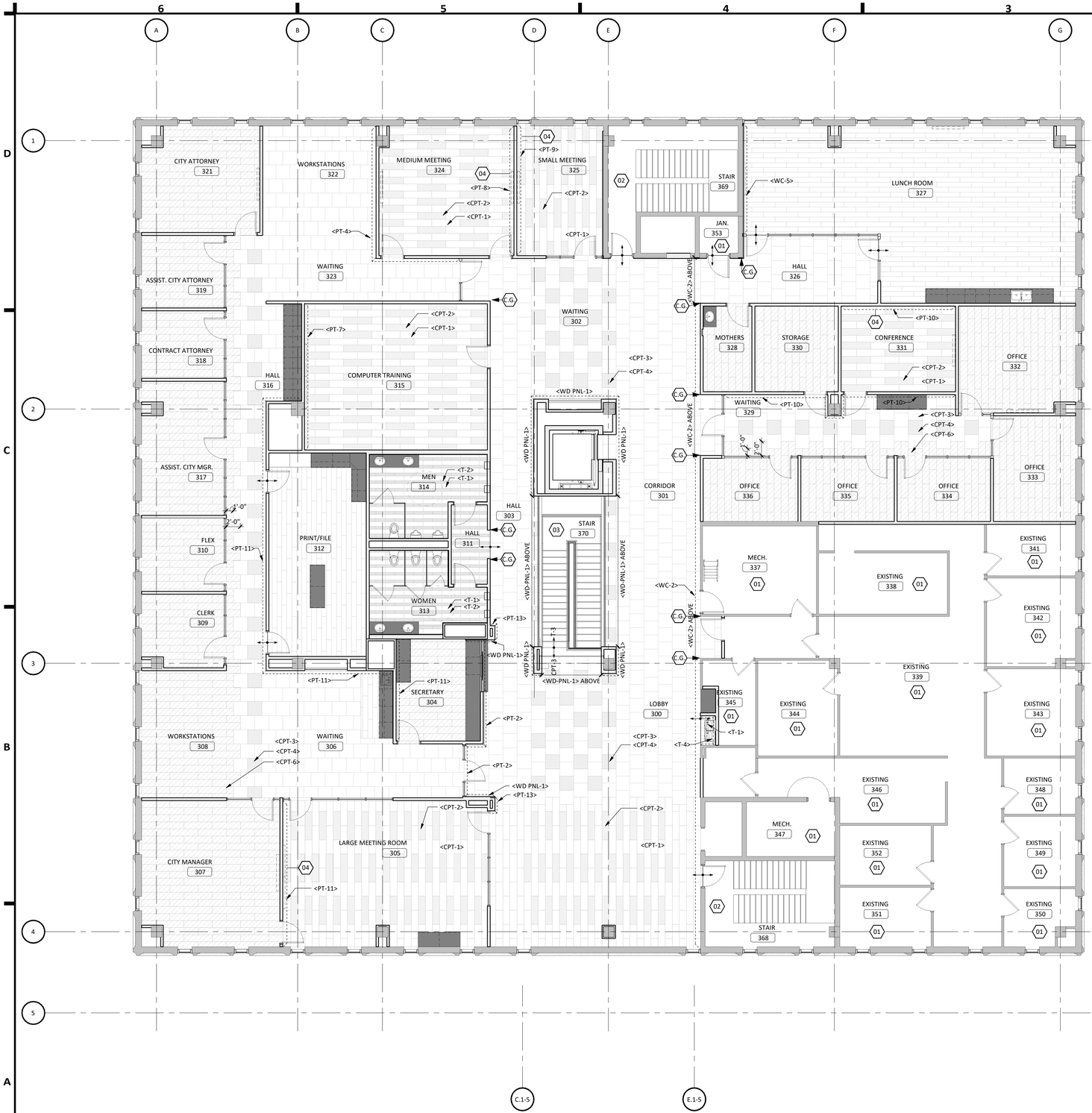
REVISION SCHEDULE

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	11/12/21

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A602
SECOND FLOOR FINISH PLAN

11/12/2021 11:43:46 AM



6A A603 THIRD FLOOR FINISH PLAN
SCALE: 1/8" = 1'-0"

SHEET MATERIAL ID LIST

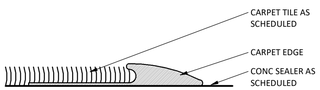
MATERIAL ID	SPEC SECTION & DESCRIPTION
CPT-1	09 6813 - TILE CARPETING
CPT-2	09 6813 - TILE CARPETING
CPT-3	09 6813 - TILE CARPETING
CPT-4	09 6813 - TILE CARPETING
CPT-6	09 6813 - TILE CARPETING
PT-2	09 9123 - PAINT
PT-4	09 9123 - PAINT
PT-7	09 9123 - PAINT
PT-8	09 9123 - PAINT
PT-9	09 9123 - PAINT
PT-10	09 9123 - PAINT
PT-11	09 9123 - PAINT
PT-13	09 9123 - PAINT
T-1	09 3000 - TILE
T-2	09 3000 - TILE
T-4	09 3000 - TILE
WC-2	09 7200 - WALL COVERINGS
WC-5	09 7200 - WALL COVERINGS
WD PNL-1	09 5100 - WOOD WALL PANEL

FINISH PLAN GENERAL NOTES

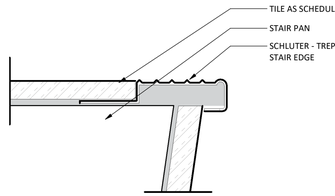
1. PAINT ALL EXPOSED CMU AND GYPSUM BOARD UNLESS NOTED OTHERWISE.
2. PROVIDE LEVEL 5 DRYWALL FINISH AT ALL APPLIED WALL GRAPHICS LOCATIONS.
3. PAINT HORIZONTAL AND VERTICAL FACES OF ALL SOFFITS AND BULKHEADS.
4. PROVIDE APPROPRIATE FLOORING TRANSITION TYPE. CENTER UNDER DOOR U.N.O AT DOOR LOCATIONS.
5. REFERENCE SPECIFICATIONS FOR MATERIALS LISTED IN FINISH SCHEDULE.

FLOOR LEGEND

- CPT-1
- CPT-2
- CPT-3
- CPT-4
- CPT-5
- CPT-6
- CPT-7
- CPT-8
- T-10
- LVT-1
- CSLR-1
- ACCESS-FLOR-CPT-1
- ACCESS-FLOR-CPT-2
- ACCESS-FLOR-ESD
- ACCESS-FLOR-LVT



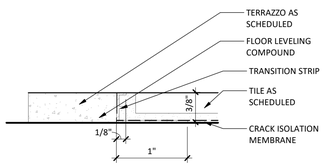
1E A603 CPT TO CONCRETE
SCALE: 12" = 1'-0"



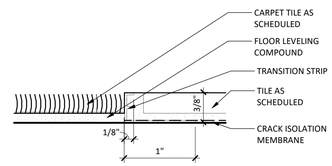
1A A603 CENTRAL STAIR TILE DETAIL
SCALE: 12" = 1'-0"

FINISH PLAN KEYNOTES

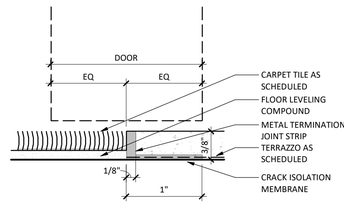
KEYNOTE	DESCRIPTION
01	EXISTING FINISHES TO REMAIN
02	EXISTING STAIR - PROVIDE NEW RUBBER TREADS/RISERS AND LANDINGS. PAINT WALLS, PROVIDE NEW CEILINGS. SEE RCP AND FINISH SCHEDULE FOR MORE INFORMATION
03	NEW STAIR - PROVIDE CERAMIC TILE AT TREADS/LANDINGS. SEE DETAILS
04	BID ALTERNATE #7 APPLIED CUSTOM VINYL SUPERGRAPHIC WALL COVERING. PROVIDE FROM TOP OF WALL OT CEILING ABOVE CUSTOM IMAGRY TO BE DEVELOPED WITH ARCHITECT PRIOR TO FABRICATION
05	ACCESS-FLOR-CPT - TO BE ORDERED WITH SPEC SECTION 09 6900
06	ACCESS-FLOR-LVT- TO BE ORDERED WITH SPEC SECTION 09 6900
07	ACCESS-FLOR-ESD - TO BE ORDERED WITH SPEC SECTION 09 6900
C.G.	CORNER GUARD - FULL HEIGHT FROM TOP OF WALL BASE TO CEILING ABOVE



1B A603 CER TILE TO TERRAZZO
SCALE: 12" = 1'-0"



1C A603 CPT TO CER TILE
SCALE: 12" = 1'-0"



1D A603 CPT TO TERRAZZO
SCALE: 12" = 1'-0"

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LICENSED ARCHITECT JENNIFER BURKE JACKSON 7360 DATE 11 04 2021 STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET **A603**
THIRD FLOOR FINISH PLAN

11/4/2021 10:20:22 AM

PRODUCT CODE	MANUFACTURER	PRODUCT	COLOR	DESCRIPTION	REMARKS
DIVISION 03 - CONCRETE					
CONCRETE FLOOR FINISHES (03 3511)					
CSLR-1 (SEALED CONCRETE)				STANDARD SEALED CONCRETE	
DIVISION 06 - WOOD, PLASTIC AND COMPONENTS					
ARCHITECTURAL WOOD CASEWORK (06 4100)					
PLAM-1 (PLASTIC LAMINATE)	WILSONART	STANDARD LAMINATE	KINGSWOOD WALNUT #8218-38	38 FINE VELVET FINISH	BASE CABINETS, TALL CABINETS
PLAM-2 (PLASTIC LAMINATE)	WILSONART	TRACELESS LAMINATE	SNOW WHITE VELVET #15501-31	TRACELESS FINISH	UPPER CABINETS
FIBERGLASS REINFORCED PANELS (06 8316)					
FRP-1 (FIBERGLASS REINFORCED PANELS)	INPRO	STANDARD FRP	DESIGNER WHITE #0101	4 x 8 PANEL	
DIVISION 09 - FINISHES					
TILING (09 3000)					
T-1 (TILE)	CERAMIC TILEWORKS	SOLERAS	AVANA	5" X 32" RECTIFIED	SEE FINISH PLANS FOR INSTALL, USE WITH G-2
T-2 (TILE)	CERAMIC TILEWORKS	SOLERAS	AVANA	8" X 32" RECTIFIED	SEE FINISH PLANS FOR INSTALL, USE WITH G-2
T-3 (TILE)	KATELO TILE	LEVEL	WHITE	12"X 24"	SEE FINISH PLANS FOR INSTALL, USE WITH G-2
T-4 (TILE)	CERAMIC TILEWORKS	SMOOTH	WHITE LUX (GLOSSY)	8" X 24"	SEE FINISH PLANS FOR INSTALL, USE WITH G-1
T-5 (TILE)	CERAMIC TILEWORKS	CHEVRON WALL	WHITE MATTE	2" X 8"	SEE FINISH PLANS FOR INSTALL, USE WITH G-2
T-6 (TILE)	CERAMIC TILEWORKS	SCALE	WHITE (GLOSSY)	5" X 4" HEXAGON	SEE FINISH PLANS FOR INSTALL, USE WITH G-2
T-7 (TILE)	CERAMIC TILEWORKS	SCALE	LIGHT GREY (GLOSSY)	5" X 4" HEXAGON	SEE FINISH PLANS FOR INSTALL, USE WITH G-2
T-8 (TILE)	CERAMIC TILEWORKS	SCALE	ELECTRIC BLUE (GLOSSY)	5" X 4" HEXAGON	SEE FINISH PLANS FOR INSTALL, USE WITH G-2
T-9 (TILE)	CERAMIC TILEWORKS	SCALE	WHITE (GLOSSY)	5" X 4.5" TRIANGOLO	SEE FINISH PLANS FOR INSTALL, USE WITH G-1
T-10 (TILE)	CERAMIC TILEWORKS	BUILDER BASICS	MATTE WHITE	2" HEXAGON MOSAIC	SEE FINISH PLANS FOR INSTALL, USE WITH G-2
GT-1 (GROUT)	HYDROMENT		BRIGHT WHITE #H177		EPOXY GROUT ONLY AT TLT./SHOWER 109 (FLOORS AND WALLS)
GT-2 (GROUT)	HYDROMENT		FRENCH GRAY #H142		EPOXY GROUT ONLY AT TLT./SHOWER 109 (FLOORS AND WALLS)
MT-1 (METAL TRIM)	SCHULTER SYSTEMS	SCHLUTER-SCHIENE	SATIN NICKEL ANODIZED ALUMINUM (AT)		ALL FLOOR TRANSITIONS, TOP OF WALL TILE, SIDES OF EXPOSED WALL TILE
MT-2 (METAL TRIM)	SCHULTER SYSTEMS	SCHLUTER-QUADEC	SATIN NICKEL ANODIZED ALUMINUM (AT)		OUTSIDE CORNERS OF WALL TILE
MT-3 (METAL TRIM)	SCHULTER SYSTEMS	SCHLUTER-DILEX-AHK	SATIN NICKEL ANODIZED ALUMINUM (AT)		COVE PROFILE AT ALL FLOOR/WALL TRANSITIONS
MT-4 (METAL TRIM)	SCHULTER SYSTEMS	SCHLUTER-TREP-E/-EK	BRUSHED STAINLESS STEEL (AT)		STAIR TREADS
ACOUSTICAL TILE CEILING (09 5100)					
ACT-1 (ACOUSTICAL CEILING TILE)	USG CORPORATION	ECLIPSE ACOUSTICAL PANELS	WHITE, PATTERN E	24" X 24" X 3/4" PAINTED MINERAL FIBER, REVEAL, EXPOSED GRID	
WCT-1 (WOOD CEILING TILE)	ARMSTRONG	WOODWORKS CONCEALED	WALNUT-CUSTOM STAIN	24" X 96" X 3/4" ,W4 ROUND STRAIGHT PERF	
RESILIENT FLOORING (09 6500)					
LVT-1 (LUXURY VINYL TILE)	J+J INVISION	TIMELESS V5011 5MM	NOTABLE #1000	9" X 48" VINYL PLANK	LUNCHROOM, BREAKROOM, PRINT AREA
ESD-1 (STATIC DISSIPATIVE TILE)	FLEXCO	DELANE ESD VINYL	TUSK #319	24" X 24" X 1/8" ESD SMOOTH VINYL	SERVER ROOMS
RBT-1 (RUBBER TILE)	NORA	NORAMENT GRANO	BLACK PEPPER #5304	40" X 40" HAMMERED SURFACE RUBBER TILE	STAIR LANDINGS
RESILIENT BASE & ACCESSORIES (09 6500)					
RB-1 (RESILIENT BASE)	JOHNSONITE	BASEWORKS THERMOSET RUBBER	CHARCOAL #20	4" RUBBER BASE	
RB-2 (RESILIENT BASE)	JOHNSONITE	MILLWORK WALL BASE, REVEAL PROFILE #MW-XX-F6	CHARCOAL #20	6" RUBBER BASE	
RST-1 (RESILIENT STAIR TREAD)	NORA	NORAMENT GRANO STAIRTREAD	BLACK PEPPER #5304	HOMOGENEOUS RUBBER, HAMMERED SURFACE TREAD	STAIRWELL TREADS
FLOORING TRANSITION	JOHNSONITE		CHARCOAL #20		
TERRAZZO (09 6600)					
TERR-1 (TERRAZZO)	TERRAZZO & MARBLE SUPPLY COMPANIES	CUSTOM BLEND	TM#21-1944	EPOXY TERRAZZO	MAIN FIELD COLOR
TERR-2 (TERRAZZO)	TERRAZZO & MARBLE SUPPLY COMPANIES	CUSTOM BLEND	TM#21-2069	EPOXY TERRAZZO	SECONDARY FIELD COLOR
TERR-3 (TERRAZZO)	TERRAZZO & MARBLE SUPPLY COMPANIES	CUSTOM BLEND	TM#21-2155	EPOXY TERRAZZO	GOLD ACCENT
TERR-4 (TERRAZZO)	TERRAZZO & MARBLE SUPPLY COMPANIES	CUSTOM BLEND	TM#21-2072	EPOXY TERRAZZO	BLUE ACCENT
TILE CARPET (09 6813)					
CPT-1 (CARPET TILE)	J+J INVISION	STRIA #7585	VINYL #2739	12" X 48"	SEE FINISH PLANS FOR INSTALL
CPT-2 (CARPET TILE)	J+J INVISION	STRIA #7586	DIMITY #2744	12" X 48"	SEE FINISH PLANS FOR INSTALL
CPT-3 (CARPET TILE)	J+J INVISION	FRACTURED PLAID #7587	FLECK #2871	24" X 24"	SEE FINISH PLANS FOR INSTALL
CPT-4 (CARPET TILE)	J+J INVISION	FRACTURED PLAID #7588	GAUZE #2876	24" X 24"	SEE FINISH PLANS FOR INSTALL
CPT-5 (CARPET TILE)	J+J INVISION	TWEED #7083	FLANNEL #2992	12" X 48"	SEE FINISH PLANS FOR INSTALL
CPT-6 (CARPET TILE)	J+J INVISION	TWEED #7084	WEFT #2984	12" X 48"	SEE FINISH PLANS FOR INSTALL
CPT-7 (WALK-OFF CARPET TILE)	J+J INVISION	INCOGNITO WALK-OFF MODULAR #7069	OPERATIVE #1837	24" X 24"	ASHLAR INSTALL
CPT-8 (CARPET TILE)	SHAW	ENTWINE TILE #59337	LINDEN #78496	24" X 24"	QUARTER TURN
ACCESS FLOORING (09 6900)					
ACCESS-FLOR-CPT 1 (ACCESS FLOORING CARPET TILE)	TATE	CONCORE 1250-POSITILE CARPET	SHAW-ENTWINE TILE-LINDEN	CARPET TILE INSERT	TO BE INSTALLED IN ACCESS FLOORING, WILL BE ORDERED WITH ACCESS FLOORING, SEE DRAWINGS FOR DETAIL, QUARTER TURN
ACCESS-FLOR-CPT 2 (ACCESS FLOORING CARPET TILE)	TATE	CONCORE 1250-POSITILE CARPET	STATICWORX-SHADOW FX-VT SLATE COLLECTION-HOOSIC RIVERBED	ESD CARPET TILE INSERT	TO BE INSTALLED IN ACCESS FLOORING, WILL BE ORDERED WITH ACCESS FLOORING, SEE DRAWINGS FOR DETAIL, QUARTER TURN
ACCESS-FLOR-LVT (ACCESS FLOORING CARPET TILE)	TATE	CONCORE 1250-POSITILE RESILIENTS	TARKETT-CONTOUR-MODERN STONE-RIALTO	LUXURY VINYL TILE INSERT	TO BE INSTALLED IN ACCESS FLOORING, WILL BE ORDERED WITH ACCESS FLOORING, SEE DRAWINGS FOR DETAIL
ACCESS-FLOR-ESD (ACCESS FLOORING ESD TILE)	TATE	CONCORE 1250-ESD VINYL	FLEXCO-DELANE ESD VINYL-TUSK #319	STATIC CONTROL VINYL INSERT	TO BE INSTALLED IN ACCESS FLOORING, WILL BE ORDERED WITH ACCESS FLOORING, SEE DRAWINGS FOR DETAIL
WALLCOVERINGS (09 7200)					
WC-1 (WALLCOVERING)	NOT USED				
WC-2 (WALLCOVERING)	MDC	EBB AND FLOW	BLUE STREAK #DG1291	TYPE II, 20 OZ., 154" WIDTH	3RD FLOOR CORRIDOR
WC-3 (WALLCOVERING)	MDC-BOLTA CONTRACT	APEX CORD	OPUS NAVY #BBAC37	TYPE II, 20 OZ., 54" WIDTH	COUNCIL CHAMBERS & MAYORS OFFICE
WC-4 (WALLCOVERING)	NOT USED				
WC-5 (WALLCOVERING)	MDC-BOLTA CONTRACT	GRATE EXPECTATIONS	HAVISHAM'S SUN #BBGE09	TYPE II, 20 OZ., 52" WIDTH	LUNCH ROOM & BREAK ROOM
WC-6 (WALLCOVERING)	MDC	DIGITAL	CUSTOM	TYPE II, 20 OZ., DREAMSCAPE SUEDE	MEETING ROOMS, 2ND FLOOR CORRIDOR
ACOUSTIC ROOM COMPONENTS (09 8400)					
FWP-1 (FABRIC WRAPPED PANEL)	MDC	ZINTRA 1" SHEET	FROST		TO BE INSTALLED AT EXITING COFFERED CEILING STRUCTURE, SEE RCP FOR LOCATIONS
PAINTING AND COATING (09 9000)					
PT-1 (PAINT)	BENJAMIN MOORE		COTTON BALLS #0C-122	EGG SHELL FINISH / FLAT FINISH AT CEILINGS	MAIN FIELD COLOR - PUBLIC SPACES
PT-2 (PAINT)	BENJAMIN MOORE		FOG MIST #0C-31	EGG SHELL FINISH / FLAT FINISH AT CEILINGS	MAIN FIELD COLOR - OFFICES
PT-3 (PAINT)	BENJAMIN MOORE		SILVER FOX #2108-50	EGG SHELL FINISH	ACCENT - PSAP DEPT.
PT-4 (PAINT)	BENJAMIN MOORE		SILHOUETTE #AF-655	EGG SHELL FINISH	ACCENT - STATE ATTORNEY & COUNCIL CONFERENCE
PT-5 (PAINT)	SHERWIN WILLIAMS		PEPPERCORN #7674	SEMI GLOSS FINISH	HOLLOW METAL DOOR FRAMES/DOORS
PT-6 (PAINT)	BENJAMIN MOORE		HALE NAVY #HC-154	EGG SHELL FINISH / FLAT FINISH AT CEILINGS	ACCENT - IT DEPT.
PT-7 (PAINT)	BENJAMIN MOORE		ABERDEEN GREEN #631	EGG SHELL FINISH	ACCENT - FINANCE DEPT. & COMPUTER TRAINING
PT-8 (PAINT)	BENJAMIN MOORE		CUSHING GREEN #HC-125	EGG SHELL FINISH	ACCENT - MEDIUM MEETING 324
PT-9 (PAINT)	BENJAMIN MOORE		DORSET GOLD #HC-8	EGG SHELL FINISH	ACCENT - SMALL MEETING 325
PT-10 (PAINT)	BENJAMIN MOORE		GOLDEN VISTA #308	EGG SHELL FINISH	ACCENT - HR DEPT.
PT-11 (PAINT)	SHERWIN WILLIAMS		BOLERO #SW 7600	EGG SHELL FINISH	ACCENT - CITY MANAGER DEPT. & LARGE MEETING 305
PT-12 (PAINT)	BENJAMIN MOORE		JUPITER GLOW #021	EGG SHELL FINISH	ACCENT - TENANT
PT-13 (PAINT)	SHERWIN WILLIAMS		GAUNTLET GRAY #7019	EGG SHELL FINISH	ACCENT - SERVICE COUNTERS
PT-14 (PAINT)	SHERWIN WILLIAMS		GAUNTLET GRAY #7019	SEMI-GLOSS FINISH	HOLLOW METAL DOOR FRAMES/DOORS - GENERAL EXISTING STAIR STRINGER/EXPOSED METAL
PT-15 (PAINT)	SHERWIN WILLIAMS		HALE NAVY #HC-154	SEMI-GLOSS FINISH	HOLLOW METAL DOOR FRAMES/DOORS - COUNCIL CHAMBERS

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
DATE 11.04.2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET **A604**
INTERIOR FINISH SCHEDULE

11/4/2021 10:14:16 AM

PT-16 (PAINT)	SHERWIN WILLIAMS		FOG MIST #0C-31	SEMI-GLOSS FINISH	NEW STAIR STRINGERS/EXPOSED METAL
STAINING AND TRANSPARENT FINISHING (09 9300)					
ST-1 (STAIN)			STAIN TO MATCH WILSONART KINGSWOOD WALNUT LAMINATE		CUSTOM STAIN FOR ALL WOOD ELEMENTS (DOORS, PANELING, ACOUSTIC WOOD CEILING, ETC.)
DIVISION 12 - FURNISHINGS					
LOUVER BLINDS/ CURTAINS AND DRAPES/ ROLLER SHADES (12 2400)					
SHADES-1 (WINDOW TREATMENT)	MECHOSHADES	THERMOVEIL - 1300	WHITE	5% OPEN MANUAL SINGLE ROLLER SOLAR SHADE	SEE DRAWINGS FOR LOCATIONS
SHADES-2 (WINDOW TREATMENT)	MECHOSHADES	CLASSIC BLACKOUT - 0700	WHITE	BLACKOUT MOTORIZED SINGLE ROLLER SHADE	SEE DRAWINGS FOR LOCATIONS
COUNTERTOPS (12 3600)					
SSM-1 (SOLID SURFACE)	HANEX	SOLID SURFACE	OSLO WHITE #B-012		BREAKROOM, LUNCHROOM, RESTROOMS, SERVICE COUNTERS, WINDOW SILLS
SSM-2 (SOLID SURFACE)	HANEX	SOLID SURFACE	WINTER WHITE #S306	INTEGRATED SINKS	RESTROOM INTEGRATED SINKS
SSM-3 (SOLID SURFACE)	HI-MAC	SOLID SURFACE	TERRAZZO GRIGIO #Q002		DAIS
PLAM-3 (PLASTIC LAMINATE)	WILSONART	STANDARD LAMINATE	CRISP LINEN #4942	38 FINE VELVET FINISH	ALL PLAM COUNTERTOPS
QTZ-1 (QUARTZ SURFACE)	CAMBRIA	QUARTZ	BRITTANICCA		COUNCIL CHAMBERS CONFERENCE, DAIS

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
DATE 11.04.2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466

DATE
11/04/21

PHASE
CONSTRUCTION DOCUMENTS

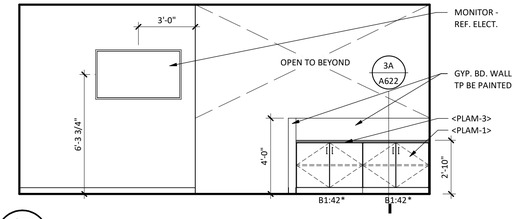
PROJECT
21019

SHEET
A605
INTERIOR FINISH SCHEDULE

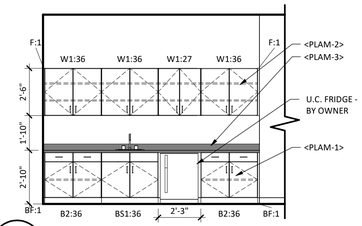
11/4/2021 10:14:18 AM

SHEET MATERIAL ID LIST

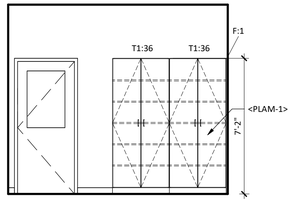
MATERIAL ID	SPEC SECTION & DESCRIPTION
PLAM-1	06 4100 - PLASTIC LAMINATE FACED CASEWORK
PLAM-2	06 4100 - PLASTIC LAMINATE FACED CASEWORK
PLAM-3	06 4100 - PLASTIC LAMINATE FACED CASEWORK
QTZ-1	12 3600 - NATURAL QUARTZ AND RESIN COUNTERTOP
SSM-1	12 3600 - SOLID SURFACE COUNTERTOP
T-9	09 3000 - TILE



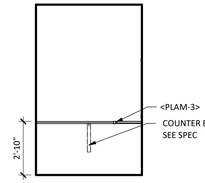
6D A611 ASSESSOR KITCHENETTE - WEST
SCALE: 1/4" = 1'-0"



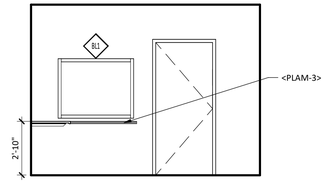
5D A611 P.I.O. - KITCHENETTE
SCALE: 1/4" = 1'-0"



4D A611 BROADCAST ROOM - WEST
SCALE: 1/4" = 1'-0"



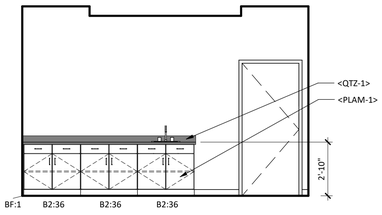
3D A611 A/V - WEST ELEV.
SCALE: 1/4" = 1'-0"



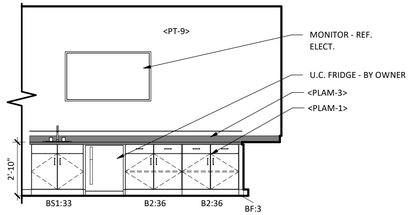
2D A611 A/V - NORTH ELEV.
SCALE: 1/4" = 1'-0"

INT. ELEVATION GENERAL NOTES

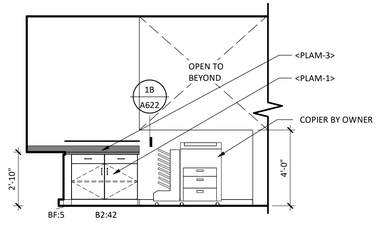
A. REFER TO A621 FOR STANDARD CASEWORK ELEVATIONS AND CONSTRUCTION.
B. ALL WALL SURFACES TO BE <PT-1> UNLESS NOTED OTHERWISE.
C. PROVIDE LEVEL '5' DRYWALL FINISH AT ALL APPLIED GRAPHICS AND WRITABLE WALL SURFACE LOCATIONS.
D. PROVIDE WALL REINFORCEMENT AT ALL WALL MOUNTED ITEMS.
E. ANY EXPOSED CABINET EDGE SHALL BE FINISHED EDGE TO MATCH ADJACENT CABINET FINISH.
F. SEE SHEET G120 FOR ALL TOILET RIM HEIGHTS AND ACCESSORY MOUNTING HEIGHTS.



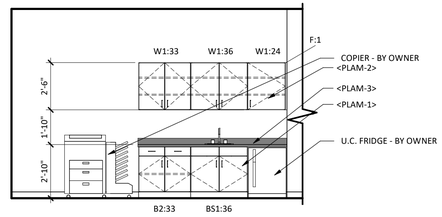
6C A611 COUNCIL CONFERENCE ROOM - SOUTH
SCALE: 1/4" = 1'-0"



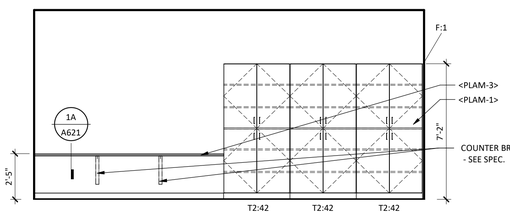
5C A611 ASSESSOR KITCHENETTE - NORTH
SCALE: 1/4" = 1'-0"



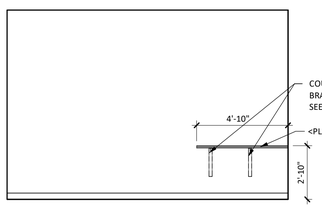
4C A611 ASSESSOR KITCHENETTE - EAST
SCALE: 1/4" = 1'-0"



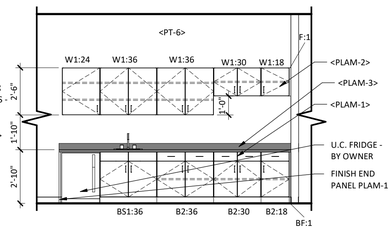
3C A611 TENANT - KITCHENETTE
SCALE: 1/4" = 1'-0"



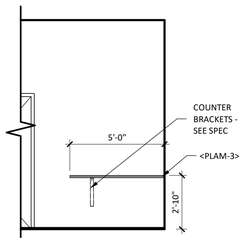
6B A611 I.T. STORAGE - WEST
SCALE: 1/4" = 1'-0"



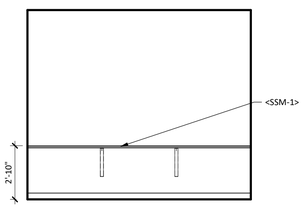
5B A611 STORAGE - WEST ELEV.
SCALE: 1/4" = 1'-0"



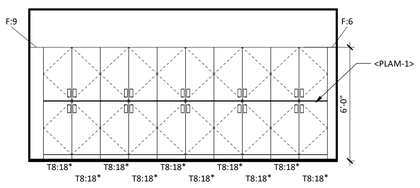
4B A611 I.T. - KITCHENETTE
SCALE: 1/4" = 1'-0"



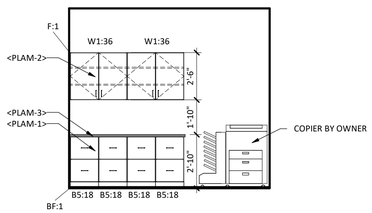
3B A611 RADIO ROOM - SOUTH
SCALE: 1/4" = 1'-0"



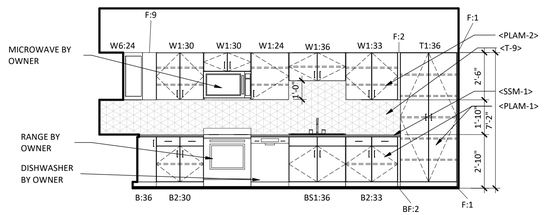
2B A611 CUST. 125 - SOUTH ELEV.
SCALE: 1/4" = 1'-0"



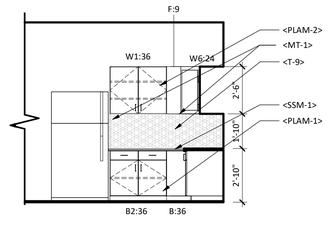
6A A611 PSAP LOCKERS
SCALE: 1/4" = 1'-0"



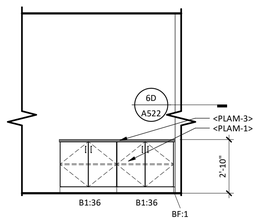
5A A611 PSAP STORAGE - SOUTH
SCALE: 1/4" = 1'-0"



4A A611 PSAP BREAKROOM - SOUTH
SCALE: 1/4" = 1'-0"



2A A611 PSAP BREAKROOM - EAST
SCALE: 1/4" = 1'-0"



1A A611 DISPATCH CONSOLES - WEST
SCALE: 1/4" = 1'-0"

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
DATE 11 04 2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

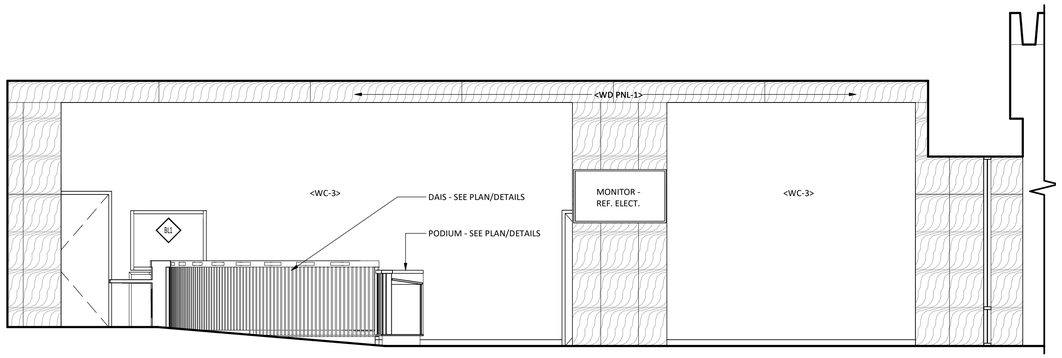
CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A611
INTERIOR ELEVATIONS

11/4/2021 10:14:27 AM

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION
PLAM-1	06 4100 - PLASTIC LAMINATE FACED CASEWORK
PLAM-2	06 4100 - PLASTIC LAMINATE FACED CASEWORK
PLAM-3	06 4100 - PLASTIC LAMINATE FACED CASEWORK
WC-3	09 7200 - WALL COVERINGS
WD PNL-1	09 5100 - WOOD WALL PANEL



5C A612 COUNCIL CHAMBERS - SOUTH
SCALE: 1/4" = 1'-0"

INT. ELEVATION GENERAL NOTES

A. REFER TO A621 FOR STANDARD CASEWORK ELEVATIONS AND CONSTRUCTION.
B. ALL WALL SURFACES TO BE <PT-1> UNLESS NOTED OTHERWISE.
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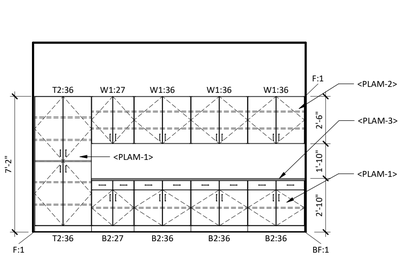
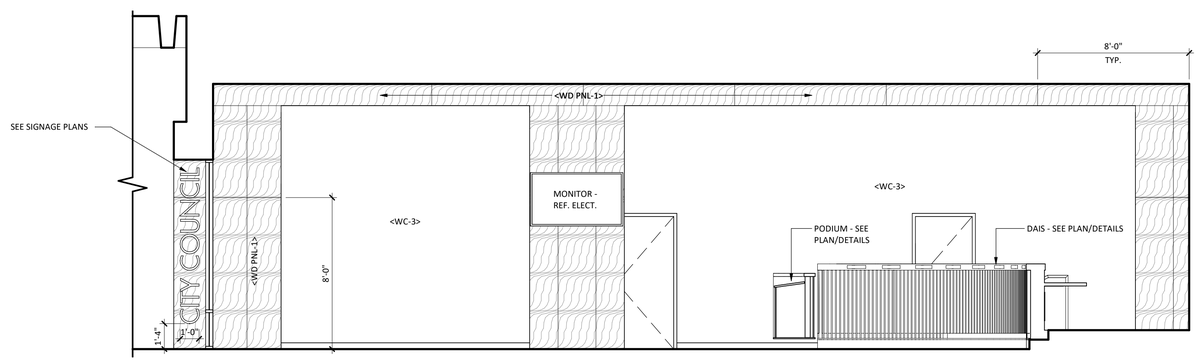
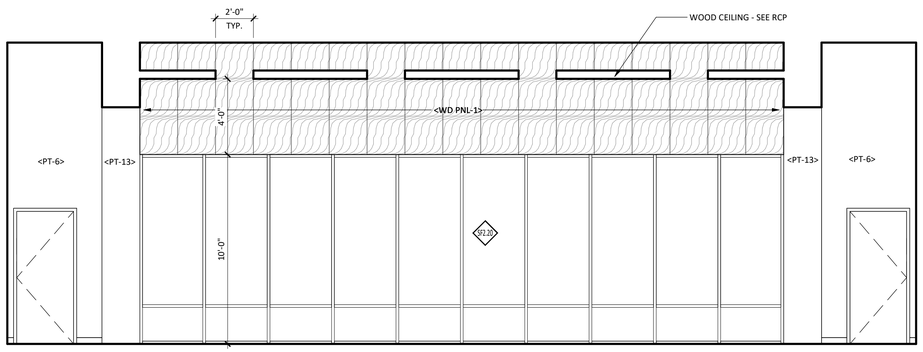


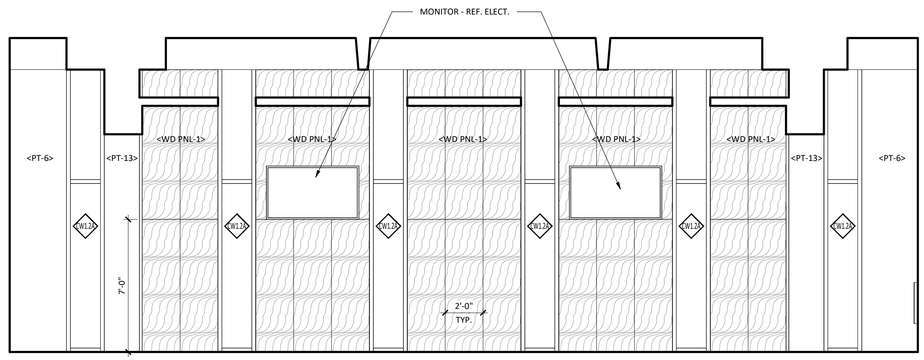
6B A612 STORAGE 224 - EAST ELEV.
SCALE: 1/4" = 1'-0"



5B A612 COUNCIL CHAMBERS - NORTH
SCALE: 1/4" = 1'-0"



6A A612 COUNCIL CHAMBERS - WEST
SCALE: 1/4" = 1'-0"



3A A612 COUNCIL CHAMBERS - EAST
SCALE: 1/4" = 1'-0"

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
7369
DATE 11 04 2021
STATE OF NORTH DAKOTA

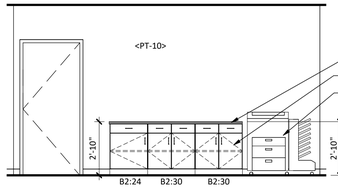
REVISION SCHEDULE

NO.	DESCRIPTION	DATE

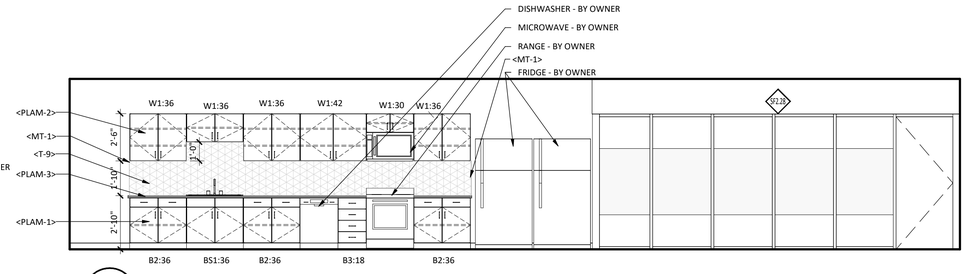
CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE
11/04/21
PHASE
CONSTRUCTION DOCUMENTS
PROJECT
21019
SHEET
A612
INTERIOR ELEVATIONS

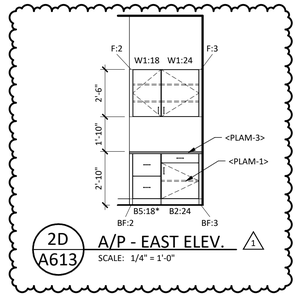
11/4/2021 10:14:32 AM



6D A613 HR - COPY/PRINT
SCALE: 1/4" = 1'-0"



5D A613 LUNCHROOM - SOUTH
SCALE: 1/4" = 1'-0"



2D A613 A/P - EAST ELEV. 1
SCALE: 1/4" = 1'-0"

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION
BCS-1	10 2800 - BABY CHANGING STATION; POLYETHYLENE
LAM GL-1	08 8000 - 2 LAYERS OF 1/8" GLASS WITH 0.060 PVB LAYER
MIR-S0	10 2800 - MIRROR; FRAMELESS
MT-1	09 3000 - TILE TRIM
PLAM-1	06 4100 - PLASTIC LAMINATE FACED CASEWORK
PLAM-2	06 4100 - PLASTIC LAMINATE FACED CASEWORK
PLAM-3	06 4100 - PLASTIC LAMINATE FACED CASEWORK
SSM-1	12 3600 - SOLID SURFACE COUNTERTOP
T-9	09 3000 - TILE

INT. ELEVATION GENERAL NOTES

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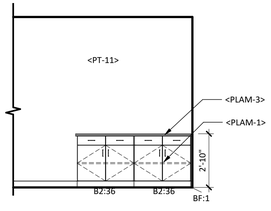
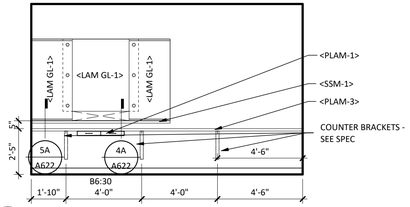
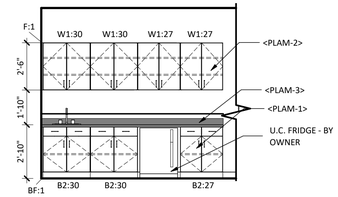


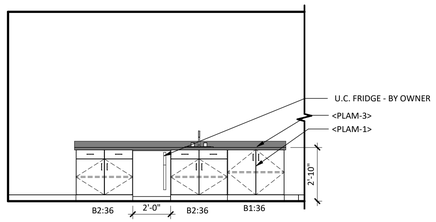
6C A613 CITY MANAGER SERVICE DESK - WEST
SCALE: 1/4" = 1'-0"



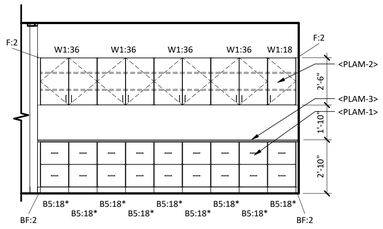
5C A613 CITY MANAGER SERVICE DESK - EAST
SCALE: 1/4" = 1'-0"



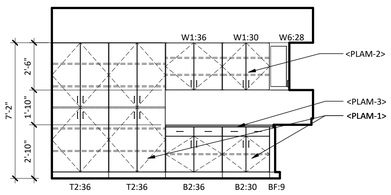
4C A613 CITY MANAGER - KITCHENETTE
SCALE: 1/4" = 1'-0"



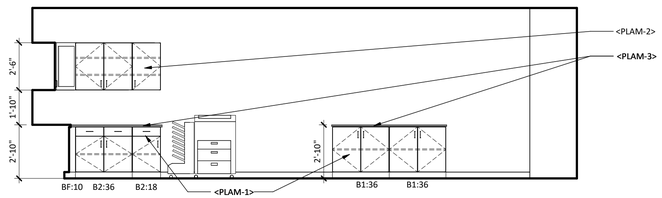
3C A613 LARGE MEETING ROOM - EAST
SCALE: 1/4" = 1'-0"



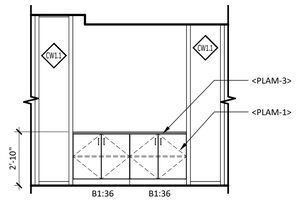
6B A613 CITY ATTORNEY STORAGE/FILES
SCALE: 1/4" = 1'-0"



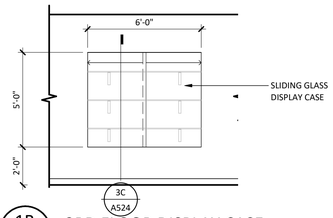
5B A613 3RD FLOOR PRINT/FILE - NORTH
SCALE: 1/4" = 1'-0"



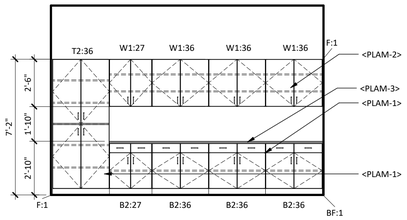
4B A613 3RD FLOOR PRINT/FILE - EAST
SCALE: 1/4" = 1'-0"



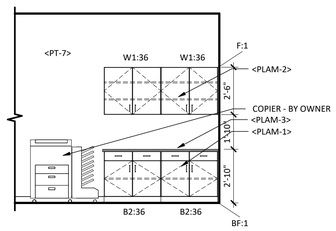
2B A613 LARGE MTG RM CAB'S
SCALE: 1/4" = 1'-0"



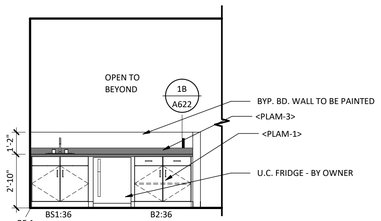
1B A613 3RD FLOOR DISPLAY CASE
SCALE: 1/4" = 1'-0"



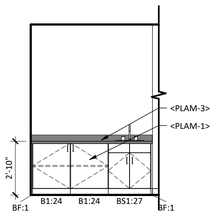
6A A613 FINANCE STORAGE - EAST
SCALE: 1/4" = 1'-0"



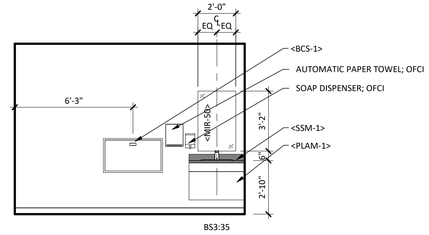
5A A613 FINANCE PRINT/COPY
SCALE: 1/4" = 1'-0"



4A A613 FINANCE KITCHENETTE
SCALE: 1/4" = 1'-0"



3A A613 MAYOR 237 - EAST ELEV.
SCALE: 1/4" = 1'-0"



2A A613 MOTHERS 328 - WEST ELEV.
SCALE: 1/4" = 1'-0"

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Bismarck, ND 58501
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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
7369
DATE 1 04 2021
STATE OF NORTH DAKOTA

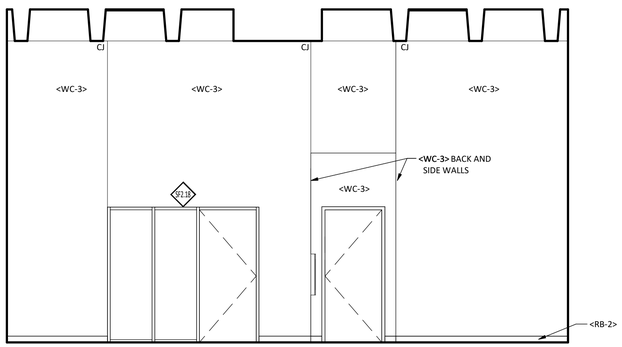
REVISION SCHEDULE

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	11/12/21

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

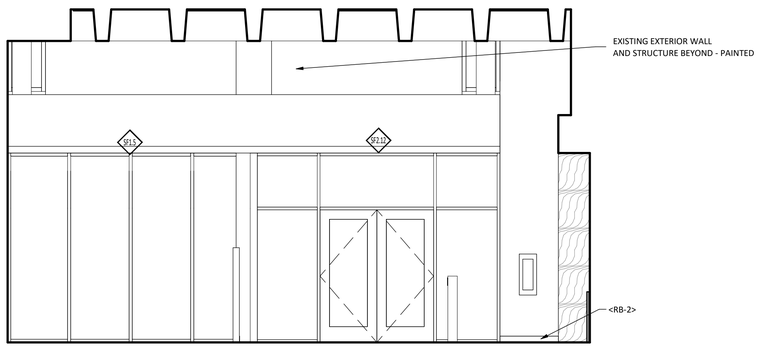
CITY PROJECT 4466
DATE
11/04/21
PHASE
CONSTRUCTION DOCUMENTS
PROJECT
21019
SHEET
A613
INTERIOR ELEVATIONS

11/12/2021 11:43:53 AM



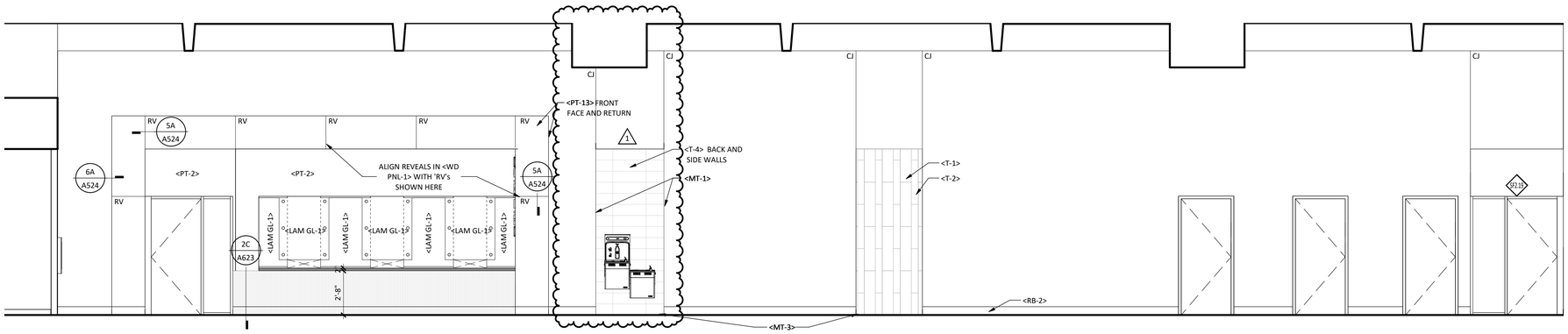
6C A614 2ND FLOOR LOBBY OVERALL - NORTH

SCALE: 1/4" = 1'-0"



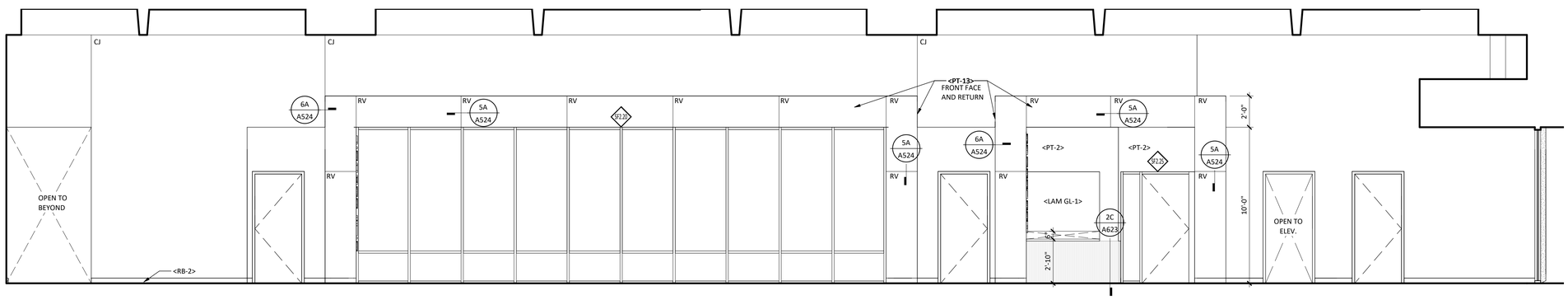
4C A614 2ND FLOOR LOBBY OVERALL - SOUTH

SCALE: 1/4" = 1'-0"



6B A614 2ND FLOOR LOBBY OVERALL - WEST

SCALE: 1/4" = 1'-0"



6A A614 2ND FLOOR LOBBY OVERALL - EAST

SCALE: 1/4" = 1'-0"

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION
LAM GL-1	08 8000 - 2 LAYERS OF 1/8" GLASS WITH 0.060 PVB LAYER
MT-1	09 3000 - TILE TRIM
MT-3	09 3000 - TILE TRIM
PT-2	09 9123 - PAINT
PT-13	09 9123 - PAINT
RB-2	09 6500 - RESILIENT BASE
T-1	09 3000 - TILE
T-2	09 3000 - TILE
T-4	09 3000 - TILE
WC-3	09 7200 - WALL COVERINGS

INT. ELEVATION GENERAL NOTES

A. REFER TO A621 FOR STANDARD CASEWORK ELEVATIONS AND CONSTRUCTION.
B. ALL WALL SURFACES TO BE <PT-1> UNLESS NOTED OTHERWISE.
C. PROVIDE LEVEL '5' DRYWALL FINISH AT ALL APPLIED GRAPHICS AND WRITABLE WALL SURFACE LOCATIONS.
D. PROVIDE WALL REINFORCEMENT AT ALL WALL MOUNTED ITEMS.
E. ANY EXPOSED CABINET EDGE SHALL BE FINISHED EDGE TO MATCH ADJACENT CABINET FINISH.
F. SEE SHEET G120 FOR ALL TOILET RIM HEIGHTS AND ACCESSORY MOUNTING HEIGHTS.

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
12464
DATE 11.04.2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	11/12/21

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A614
INTERIOR ELEVATIONS

11/12/2021 11:43:57 AM

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION
LAM GL-1	08 8000 - 2 LAYERS OF 1/8" GLASS WITH 0.060 PVB LAYER
MT-1	09 3000 - TILE TRIM
MT-3	09 3000 - TILE TRIM
PT-1	09 9123 - PAINT
PT-2	09 9123 - PAINT
PT-13	09 9123 - PAINT
RB-2	09 6500 - RESILIENT BASE
SSM-1	12 3600 - SOLID SURFACE COUNTERTOP
T-1	09 3000 - TILE
T-2	09 3000 - TILE
T-4	09 3000 - TILE
WC-2	09 7200 - WALL COVERINGS

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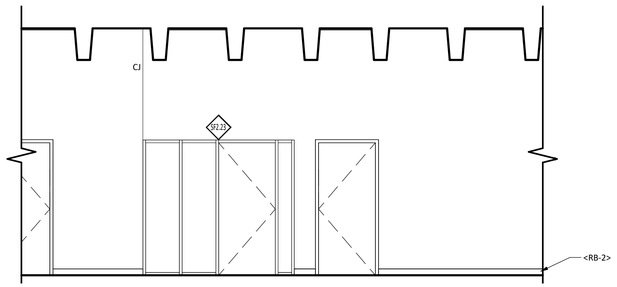
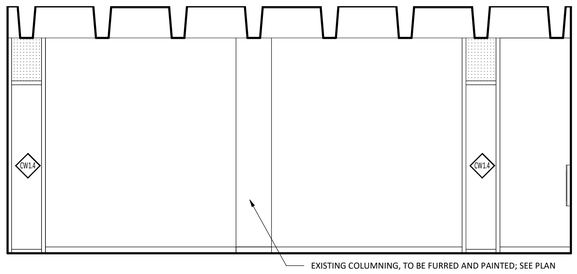
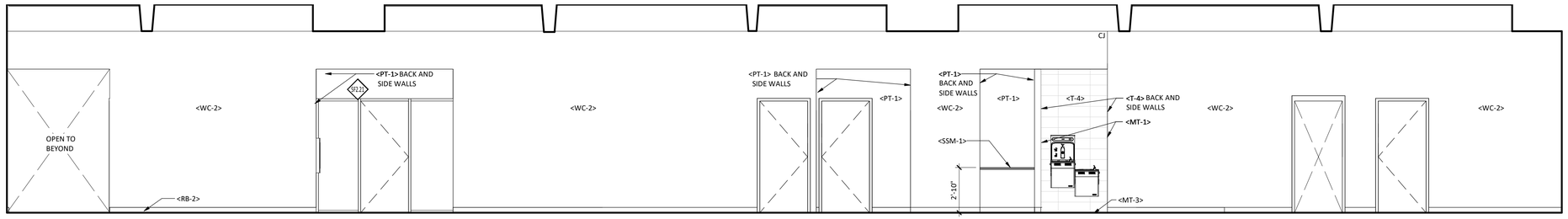


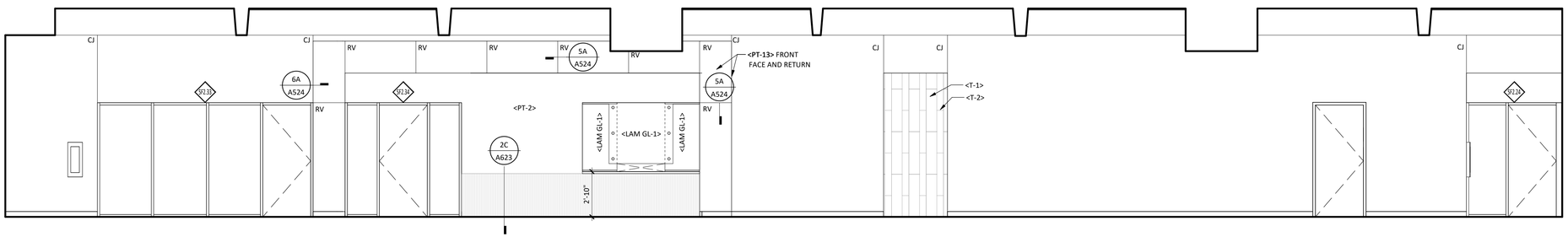
6D A615 3RD FLOOR LOBBY - NORTH
SCALE: 1/4" = 1'-0"



4D A615 3RD FLOOR LOBBY - SOUTH
SCALE: 1/4" = 1'-0"



6B A615 3RD FLOOR LOBBY - EAST
SCALE: 1/4" = 1'-0"



6A A615 3RD FLOOR LOBBY - WEST
SCALE: 1/4" = 1'-0"

11/4/2021 10:14:47 AM

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
7369
DATE 11.04.2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE
11/04/21
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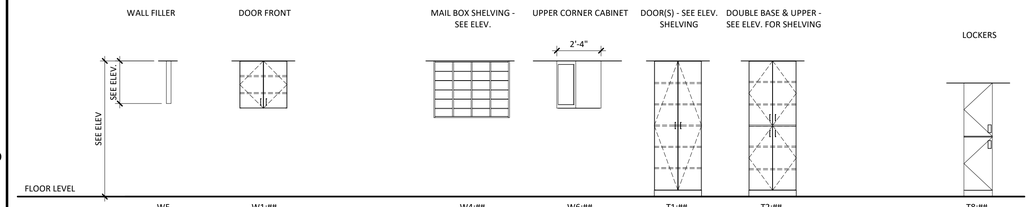
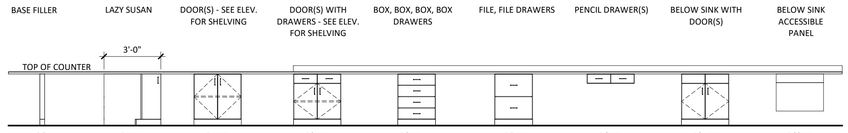
CONSTRUCTION DOCUMENTS
PROJECT
21019
SHEET
A615
INTERIOR ELEVATIONS





SHEET MATERIAL ID LIST

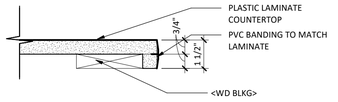
MATERIAL ID	SPEC SECTION & DESCRIPTION
SEALANT-1	07 9200 - JOINT SEALANT OR CAULKING WITH OR WITHOUT BACKER ROD
WD BLKG	06 1000 - WOOD BLOCKING

CASEWORK GENERAL NOTES

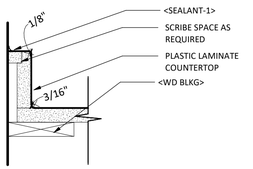
1. CASEWORK & ARCHITECTURAL WOODWORK CONTRACTOR(S) SHALL CAREFULLY EXAMINE THE DRAWINGS AND SPECIFICATIONS TO PROPERLY DETERMINE CONTRACTUAL RESPONSIBILITIES.
2. FOR ACTUAL ROOM DIMENSIONS REFER TO FLOOR PLANS. CONTRACTOR SHALL FIELD CHECK ALL DIMENSIONS BEFORE FABRICATION.
3. OVERALL LENGTH OF TOPS SHALL BE DETERMINED BY CASEWORK DIMENSIONS AS INDICATED ON PLANS. SUCH LENGTHS SHALL REMAIN CONSTANT REGARDLESS OF SUCCESSFUL BIDDER'S STANDARDS.
4. OVERALL HEIGHT OF BASE CABINET TOPS MUST BE MAINTAINED AS SHOWN ON INTERIOR ELEVATIONS.
5. INSTALLATION OF CASEWORK SHALL BEGIN AT THE HIGH POINT OF THE ROOM WITH ANY LEVELERS IN AS FAR AS POSSIBLE.
6. COUNTERTOPS AND SPLASHES SHALL BE SCRIBED TO MATCH IRREGULARITIES AND CONTOURS OF WALLS.
7. CASEWORK SHALL BE INSTALLED ON TOP OF FINISHED VCT, OR WELDED SHEET FLOORING WHERE THESE FLOOR FINISHES ARE SCHEDULED.
8. PROVIDE FINISHED BACK & END PANELS TO COMPLETE THE ENCLOSURE OF ALL CABINETRY TO WALLS AND ADJACENT CABINETRY.
9. REFER TO ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.
10. PROVIDE EQUAL SIZED FILLERS AT WALLS WHERE CONTINUOUS RUN OF CASEWORK ABUTS TWO WALLS.
11. PROVIDE BRACKET AT ANY COUNTER OR SHELF SPANNING MORE THAN 4'-0" UNSUPPORTED.
12. DOORS IN TALL CABINETS (TYPE 'T' CABINETS) SHALL BE 3/4" THICK.
13. SEE INTERIOR ELEVATIONS FOR LOCKING CONFIGURATIONS AND LOCATIONS.
14. SEE INTERIOR ELEVATIONS FOR ALL FINISHES.
15. PROVIDE GROMMET HOLES AT ALL COUNTERTOPS WITH KNEE SPACE. LOCATE GROMMETED OPENINGS IN FIELD (COOR. W/MISC. EQUIPMENT) AT 4'-0" O.C. MAX, AND 1 PER COUNTER MIN.
16. BASE FINISH AT CABINETS SHALL BE RESILIENT BASE.
17. INTERIOR FINISH AT OPEN CABINETS WITHOUT DOORS SHALL MATCH THE COLOR, MATERIAL AND FINISH OF ADJACENT CABINET EXTERIORS, U.N.O.
18. CONCEALED CABINET BACKS, DRAWER BODY, AND DRAWER BOTTOMS: 1/2" THICKNESS.
19. DOOR AND DRAWER FACE, WALL AND TALL CABINET TOP AND BOTTOMS, CABINET SIDES, DRAWER SPREADERS, CABINET BACK REAR HANGSTRIPS, STRUCTURAL DIVIDERS, EXPOSED CABINET BACKS, AND SHELVES OF LESS THAN 30 INCH SPACE: 3/4" THICKNESS.
20. SHELVES OVER 30 INCH SPAN AND LIBRARY STACK SHELVING: 1" THICKNESS.

WALL CABINETS

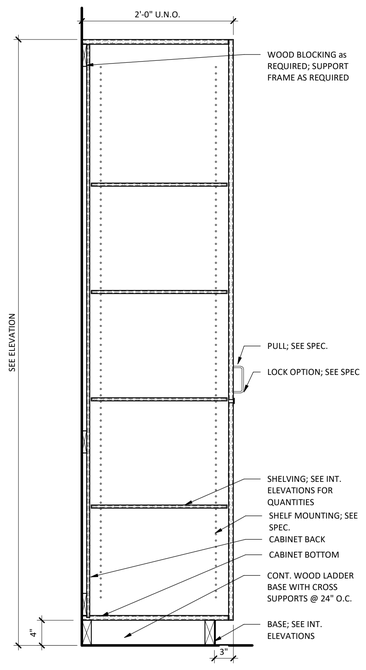
BASE CABINETS



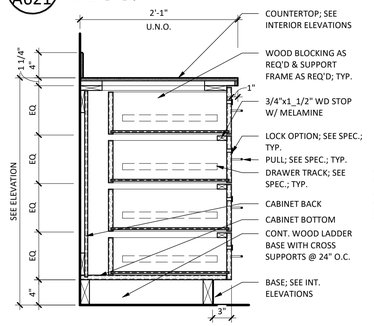
5C A621 COUNTERTOP EDGE
SCALE: 3" = 1'-0"



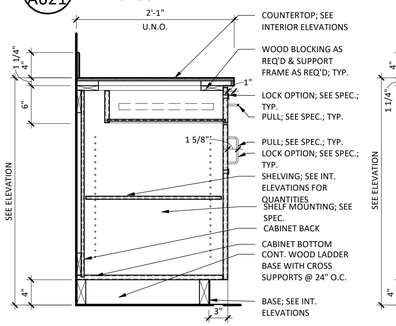
4C A621 BACKSPLASH SCRIBE
SCALE: 3" = 1'-0"



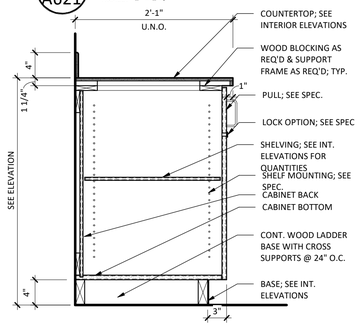
6B A621 T1 - TALL CAB. W/ DOOR(S)
SCALE: 1" = 1'-0"



5B A621 T2 - DOUBLE UPPER & BASE
SCALE: 1" = 1'-0"



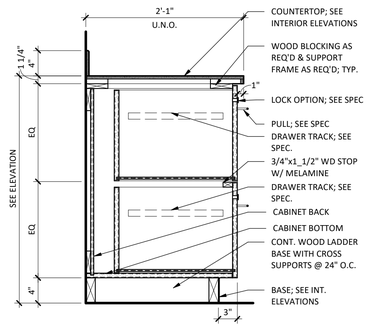
4B A621 T8 - LOCKERS
SCALE: 1" = 1'-0"



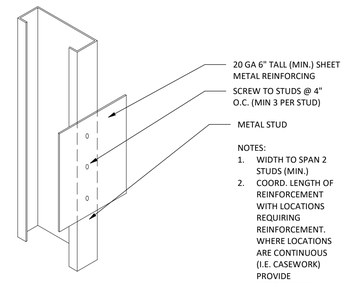
6A A621 B3 - BASE CAB. 4 BOX
SCALE: 1" = 1'-0"

5A A621 B2 - BASE BA. W/ DOOR, DRAWER
SCALE: 1" = 1'-0"

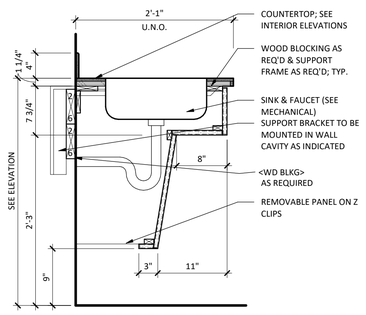
4A A621 B1 - BASE CAB. WITH DOOR(S)
SCALE: 1" = 1'-0"



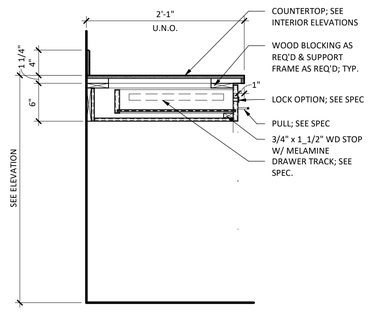
3C A621 B5 - BASE CAB. 2 FILE
SCALE: 1" = 1'-0"



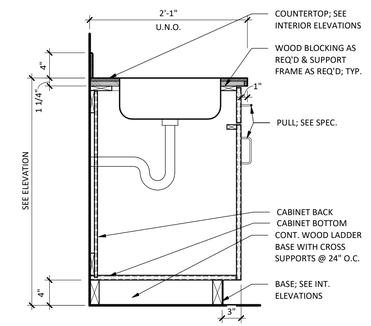
3B A621 WALL REINFORCEMENT
SCALE: 3" = 1'-0"



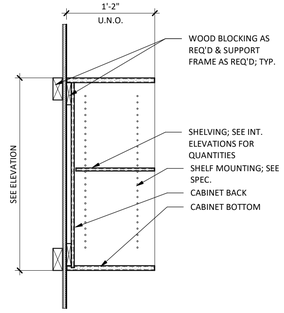
3A A621 BS3 - BELOW SINK ACCESSIBLE PANEL
SCALE: 1" = 1'-0"



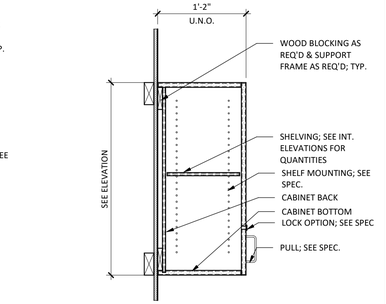
2C A621 B6 - PENCIL DRAWER
SCALE: 1" = 1'-0"

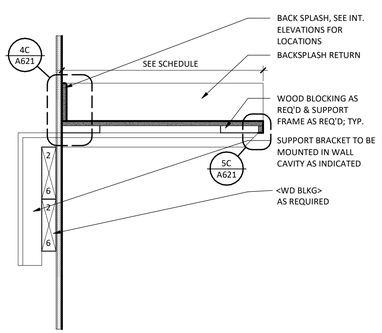


2B A621 W4 - WALL CAB. OPEN SHELVING
SCALE: 1" = 1'-0"



1B A621 W1 - WALL CAB. DOOR FRONT
SCALE: 1" = 1'-0"





6A A621 B3 - BASE CAB. 4 BOX
SCALE: 1" = 1'-0"

5A A621 B2 - BASE BA. W/ DOOR, DRAWER
SCALE: 1" = 1'-0"

4A A621 B1 - BASE CAB. WITH DOOR(S)
SCALE: 1" = 1'-0"

3A A621 BS3 - BELOW SINK ACCESSIBLE PANEL
SCALE: 1" = 1'-0"

2A A621 BS1 - BELOW SINK CABINET
SCALE: 1" = 1'-0"

1A A621 COUNTERTOP DETAIL
SCALE: 1 1/2" = 1'-0"

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LICENSED ARCHITECT JENNIFER BURKE JACKSON DATE 11 04 2021 STATE OF NORTH DAKOTA

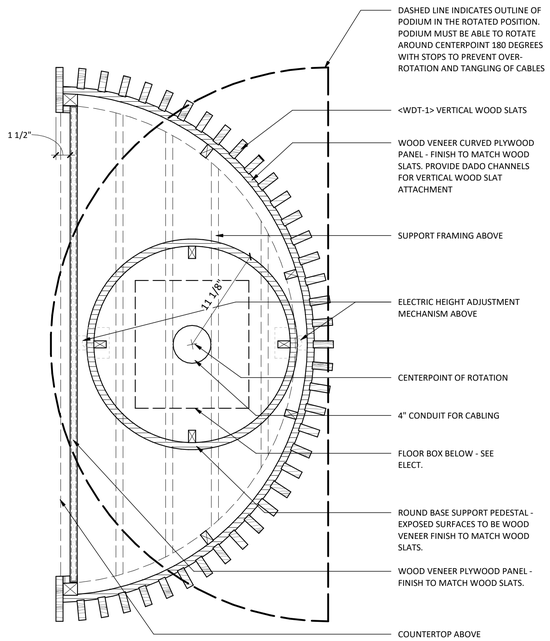
REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

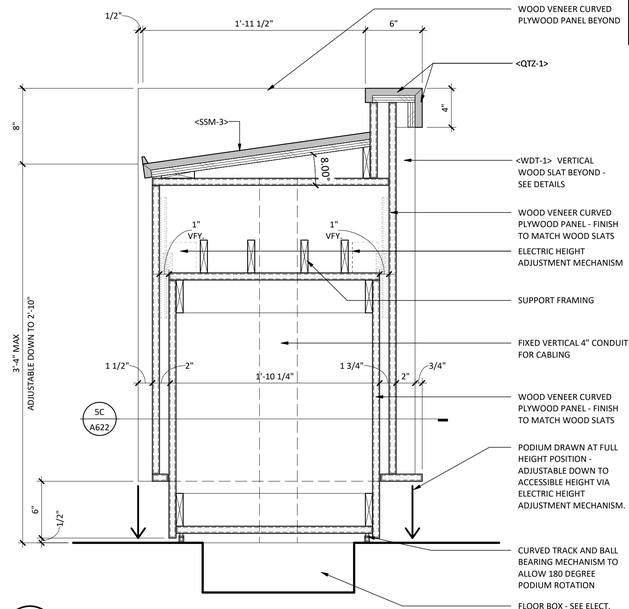
CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A621
CASEWORK SCHEDULE/DETAILS

11/4/2021 10:14:51 AM



5C A622 PODIUM PLAN DETAIL

SCALE: 1 1/2" = 1'-0"

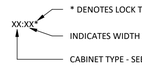


3C A622 PODIUM SECTION

SCALE: 1 1/2" = 1'-0"

SHEET MATERIAL ID LIST	
MATERIAL ID	**SPEC SECTION & DESCRIPTION**
GYP BD-1	09 2116 - 5/8" TYPE X GYPSUM BOARD
MET STUD-2	09 2116 - NON-LOADBEARING METAL STUDS, 20 GA
PLAM-3	06 4100 - PLASTIC LAMINATE FACED CASEWORK
QTZ-1	12 3600 - NATURAL QUARTZ AND RESIN COUNTERTOP
SSM-1	12 3600 - SOLID SURFACE COUNTERTOP
SSM-3	12 3600 - SOLID SURFACE COUNTERTOP
WD BLKG	06 1000 - WOOD BLOCKING
WD SHTG-30	06 1000 - 1/2" SHEATHING
WDT-1	06 2000 - WOOD TRIM

CASEWORK GENERAL NOTES



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15. PROVIDE GROMMET HOLES AT ALL COUNTERTOPS WITH KNEE SPACE. LOCATE GROMMETED OPENINGS IN FIELD (COOR. W/MISC. EQUIPMENT) AT 4'-0" O.C. MAX, AND 1 PER COUNTER MIN.
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18. CONCEALED CABINET BACKS, DRAWER BODY, AND DRAWER BOTTOMS: 1/2" THICKNESS.
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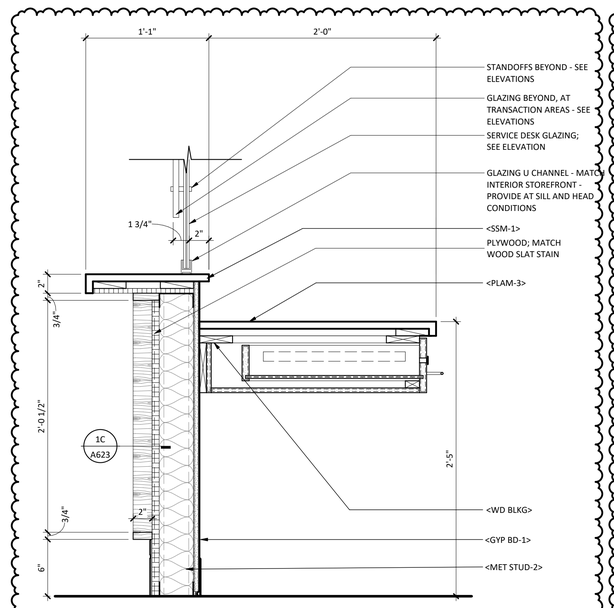
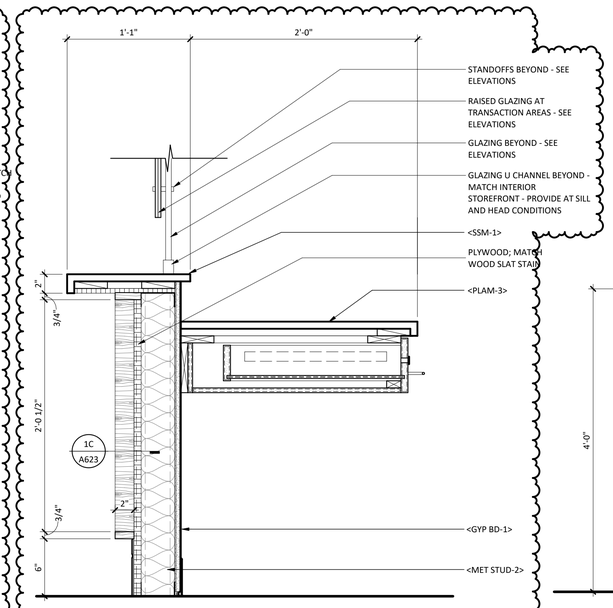
20. SHELVES OVER 30 INCH SPAN AND LIBRARY STACK SHELVING: 1" THICKNESS.



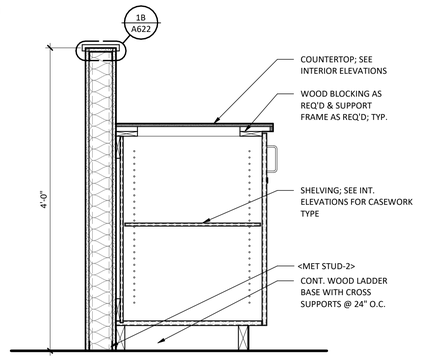
5A A622 CHECK-IN DESK SECTION ⚠1

SCALE: 1 1/2" = 1'-0"



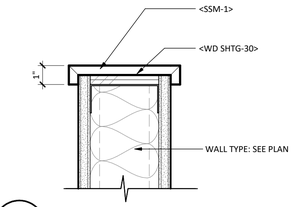
4A A622 CHECK-IN DESK SECTION - OPENING ⚠1

SCALE: 1 1/2" = 1'-0"



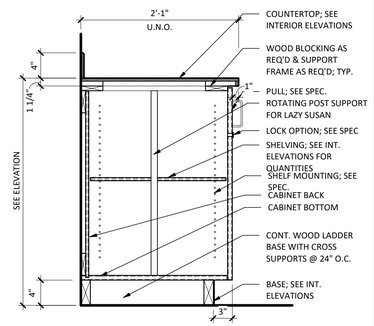
3A A622 DIVIDER WALL SECTION

SCALE: 1" = 1'-0"



1B A622 DIVIDER WALL CAP DETAIL

SCALE: 3" = 1'-0"



1A A622 B - BASE CAB. LAZY SUSAN

SCALE: 1" = 1'-0"

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
DATE 11.04.2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE		
NO.	**DESCRIPTION**	**DATE**
1	ADDENDUM 1	11/12/21

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466

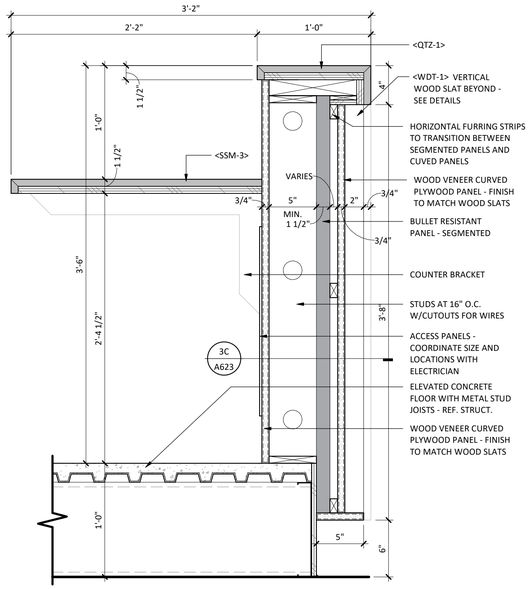
DATE
11/04/21

PHASE
CONSTRUCTION DOCUMENTS

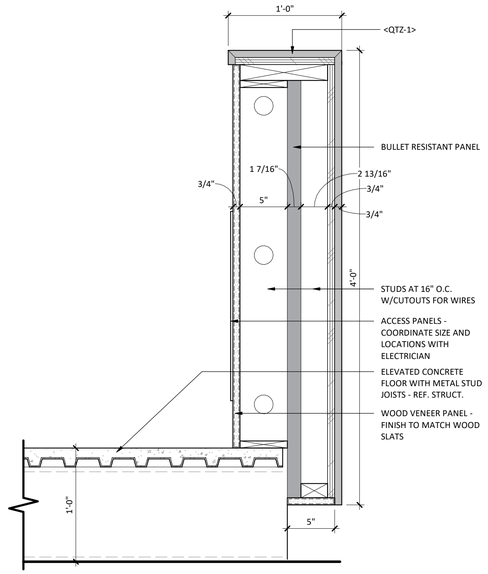
PROJECT
21019

SHEET
A622
CASEWORK SCHEDULE/DETAILS

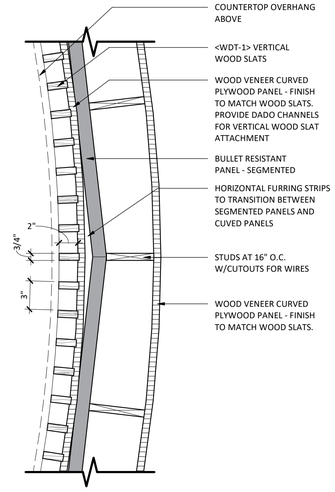
11/12/2021 11:43:58 AM



6C A623 DAIS SECTION AT COUNTER
SCALE: 1 1/2" = 1'-0"



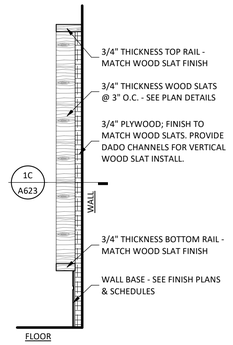
5C A623 DAIS SECTION AT WALL
SCALE: 1 1/2" = 1'-0"

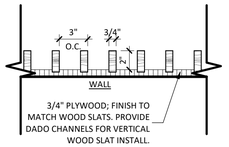


3C A623 DAIS - PLAN DETAIL
SCALE: 1 1/2" = 1'-0"

SHEET MATERIAL ID LIST

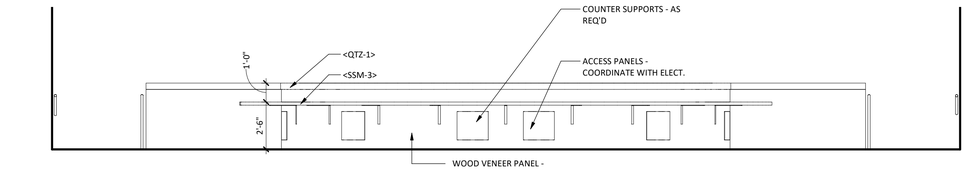
MATERIAL ID	SPEC SECTION & DESCRIPTION
QTZ-1	12 3600 - NATURAL QUARTZ AND RESIN COUNTERTOP
SSM-3	12 3600 - SOLID SURFACE COUNTERTOP
WDT-1	06 2000 - WOOD TRIM



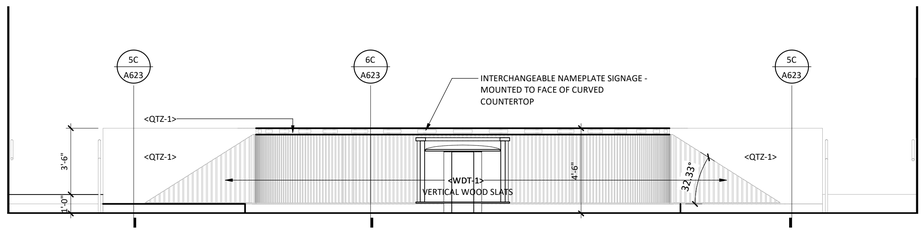


2C A623 SERVICE COUNTER SLATS (SECTION)
SCALE: 1 1/2" = 1'-0"

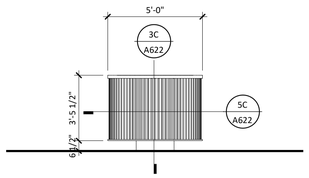
1C A623 SERVICE COUNTER SLATS (PLAN)
SCALE: 1 1/2" = 1'-0"



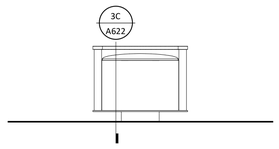
6B A623 COUNCIL CHAMBERS DIAS - BACK ELEVATION
SCALE: 1/4" = 1'-0"



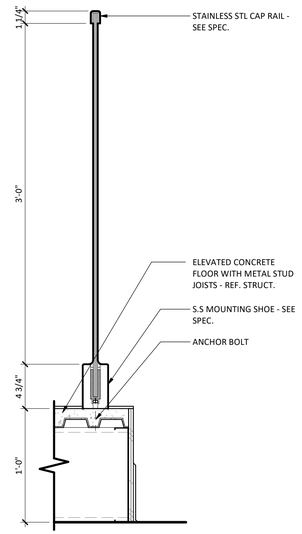
6A A623 COUNCIL CHAMBERS DIAS - FRONT ELEVATION
SCALE: 1/4" = 1'-0"



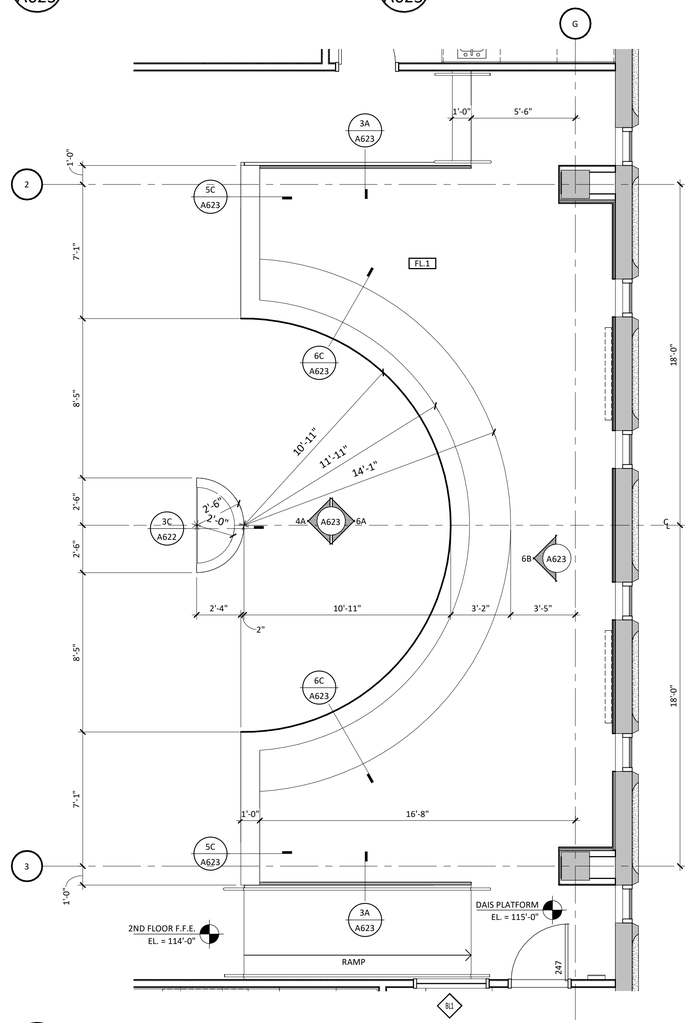
4A A623 COUNCIL CHAMBERS PODIUM - FRONT ELEV.
SCALE: 1/4" = 1'-0"



5A A623 COUNCIL CHAMBERS PODIUM - BACK ELEV.
SCALE: 1/4" = 1'-0"



3A A623 DAIS SECTION AT GUARDRAIL
SCALE: 1 1/2" = 1'-0"



2A A623 ENLARGED PLAN - COUNCIL CHAMBERS DIAS
SCALE: 1/4" = 1'-0"

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LICENSED ARCHITECT JENNIFER BURKE JACKSON 12466 DATE 11 04 2021 STATE OF NORTH DAKOTA

REVISION SCHEDULE

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MINOT, ND

CITY PROJECT 4466
DATE
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CONSTRUCTION DOCUMENTS
PROJECT
21019
SHEET
A623
CASEWORK ENLARGED PLANS & DETAILS

11/4/2021 10:14:59 AM

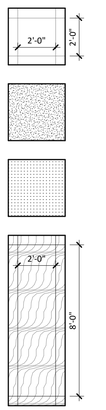
CEILING PLAN KEYNOTES

KEYNOTE	DESCRIPTION
1	EXPOSED STRUCTURE, PAINT <PT-1> U.N.O ON RCP.
2	MANUAL WINDOW SHADE <SHADES-1> SEE DETAIL 6D/A704
3	ELECTRICAL WINDOW SHADE <SHADES-2> SEE DETAIL 5D/A704
4	EXISTING CEILING IS TO REMAIN - REMOVE, SALVAGE, AND REINSTALL CEILING TILES AS REQUIRED FOR INSTALLATION OF FIRE SPRINKLER SYSTEM. SEE MEP FOR MORE INFO.
5	PAINT UNDERSIDE OF EXISTING STAIRS AND INTERMEDIATE LANDINGS <PT-1>
6	PAINT GYPSUM BOARD AT UNDERSIDE OF NEW STAIR <PT-2>
7	PROVIDE 1-HR RATED ASSEMBLY AT UNDERSIDE OF STAIR WITHIN MECHANICAL ROOM 131. SES STAIR DETAILS
8	EXPOSED STRUCTURE TO REMAIN UNPAINTED
9	SKYLIGHT - PREFINISHED SEE SPEC
10	STEEL SKYLIGHT CURB BRACING, TYP. SEE STRUCTURAL TO BE PAINTED <PT-2>
11	EXISTING CANOPY SOFFIT MATERIAL TO REMAIN IN BASE BID.

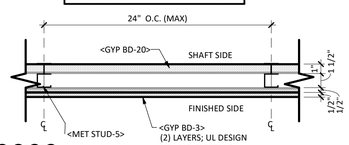
RCP GENERAL NOTES

1. COORDINATE FINAL SIZE AND FINAL LOCATION OF ALL ACCESS PANELS WITH TRADE REQUIRING SAME.
2. COORDINATE CEILING SUSPENSION SYSTEMS WITH OTHER CEILING SPACE EQUIPMENT SUPPORTING DEVICES.
3. FOR PARTITION TYPES, SEE TYPICAL ASSEMBLIES SHEET(S).
4. REFER TO LIFE SAFETY PLANS FOR LOCATIONS OF FIRE AND SMOKE RATED PARTITIONS.
5. CEILING GRID SYSTEM TO BE CENTERED IN ROOM IN BOTH DIRECTIONS UNLESS NOTED OTHERWISE.
6. NO CEILING PANEL TO BE CUT TO LESS THAN 6" WIDTH AT CEILING PANEL INSTALLATION.
7. AT CONDITIONS WHERE CEILING TILE PADS EXCEED 2'-0" TRIM 2'X4' CEILING PADS AS REQUIRED TO FIT.
8. SPRINKLER HEADS TO BE LOCATED IN THE CENTER OF CEILING PANELS IF FEASIBLE.
9. PAINT ALL EXPOSED (VISUAL) CONSTRUCTION ABOVE CEILINGS - INCLUDING, BUT NOT LIMITED TO, MECHANICAL AND ELECTRICAL ITEMS. SEE NOTES ON SHEET FOR EXTENT OF SCOPE.
10. VERIFY EXACT LOCATIONS OF SOFFIT AND CEILING CONTROL JOINTS WITH THE ARCHITECTS REPRESENTATIVE IN THE FIELD.
11. COORDINATE THE LOCATION OF ESCUTCHEON PLATES AT CEILING PANEL PENETRATIONS WITH ELECTRICAL AND MECHANICAL TRADES.
12. SEE ELECTRICAL DRAWINGS FOR FIXTURE TYPES AND NIGHT LIGHT LOCATIONS.
13. PATCH AND REPAIR THE EXISTING CEILING PANELS AND GRID WHERE WALLS WERE REMOVED.
14. CONTRACTOR SHALL MAINTAIN THE FIRE RATING INTEGRITY OF ALL EXISTING PARTITIONS INDICATED AS FIRE RESISTANCE RATED. ADVISE THE ARCHITECT OF ANY PRE-EXISTING BREACHES DISCOVERED IN THE COURSE OF WORK.
15. ALL GYPSUM CEILINGS TO BE PAINTED PT-1 U.N.O.

RCP LEGEND



ALTERNATE DESIGNS FOR CABLE FIRE-RATED PROTECTION ALLOWED; MUST BE 2-HOUR FIRE-RATED - SEE ELEC. SHEETS FOR ROUTING & CABLE SIZE REQUIREMENTS



6A / A701 FIRST FLOOR REFLECTED CEILING PLAN
SCALE: 1/8" = 1'-0"

2A / A701 CABLE FIRE-RATED SURROUND DETAIL
SCALE: 1 1/2" = 1'-0"

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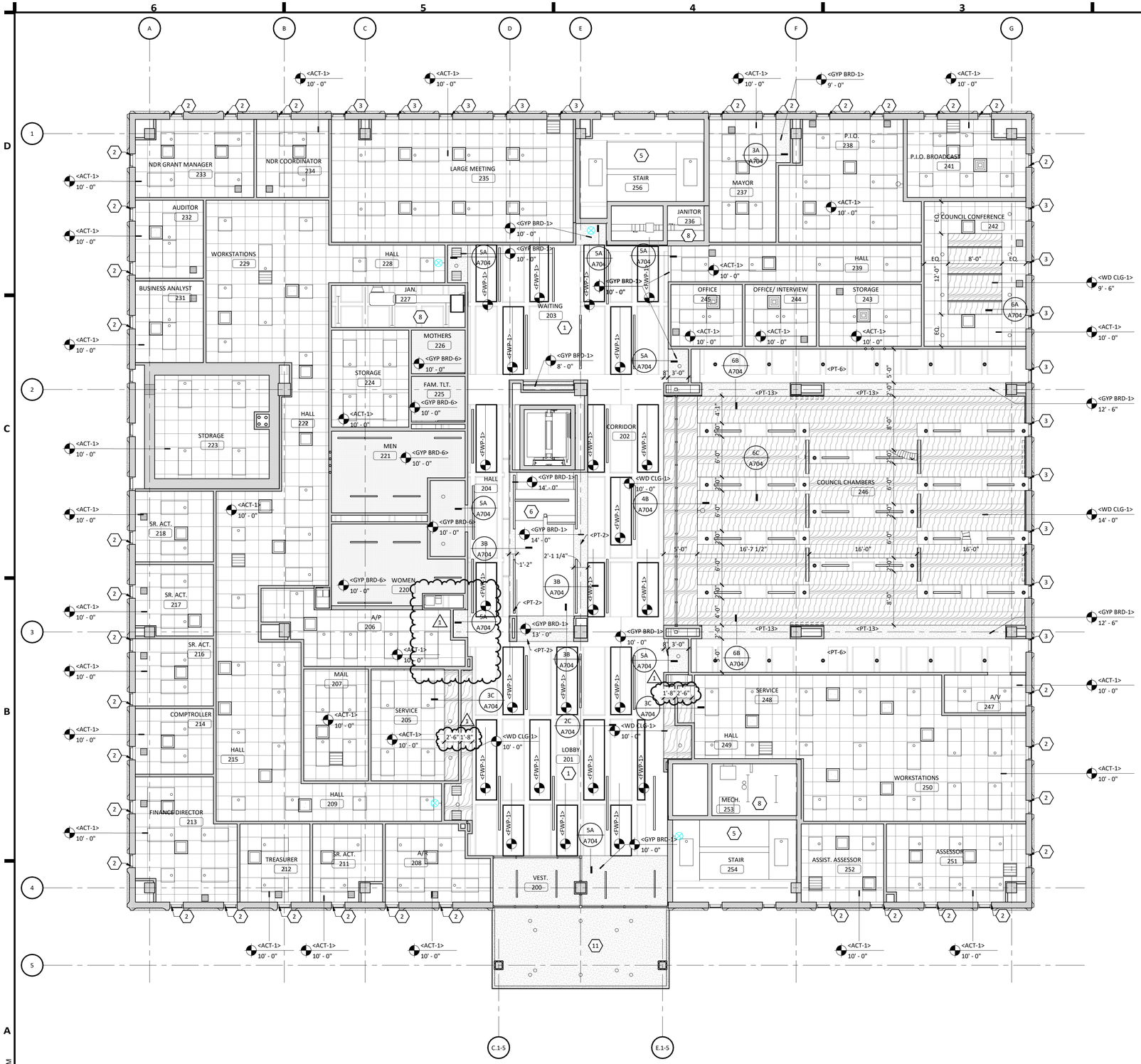
LICENSED ARCHITECT JENNIFER BURKE JACKSON 7366 11/04/2021 STATE OF NORTH DAKOTA

REVISION SCHEDULE		
NO.	DESCRIPTION	DATE
2	ADDENDUM 2	11/18/21

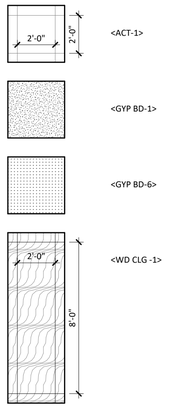
CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A701
FIRST FLOOR RCP

11/18/2021 9:15:52 PM



RCP LEGEND



CEILING PLAN KEYNOTES

KEYNOTE	DESCRIPTION
1	EXPOSED STRUCTURE, PAINT <PT-1> U.N.O ON RCP.
2	MANUAL WINDOW SHADE <SHADES-1> SEE DETAIL 6D/A704
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4	EXISTING CEILING IS TO REMAIN - REMOVE, SALVAGE, AND REINSTALL CEILING TILES AS REQUIRED FOR INSTALLATION OF FIRE SPRINKLER SYSTEM. SEE MEP FOR MORE INFO.
5	PAINT UNDERSIDE OF EXISTING STAIRS AND INTERMEDIATE LANDINGS <PT-1>
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8	EXPOSED STRUCTURE TO REMAIN UNPAINTED
9	SKYLIGHT - PREFINISHED SEE SPEC
10	STEEL SKYLIGHT CURB BRACING, TYP. SEE STRUCTURAL TO BE PAINTED <PT-2>
11	EXISTING CANOPY SOFFIT MATERIAL TO REMAIN IN BASE BID.

RCP GENERAL NOTES

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4. REFER TO LIFE SAFETY PLANS FOR LOCATIONS OF FIRE AND SMOKE RATED PARTITIONS.
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12. SEE ELECTRICAL DRAWINGS FOR FIXTURE TYPES AND NIGHT LIGHT LOCATIONS.
13. PATCH AND REPAIR THE EXISTING CEILING PANELS AND GRID WHERE WALLS WERE REMOVED.
14. CONTRACTOR SHALL MAINTAIN THE FIRE RATING INTEGRITY OF ALL EXISTING PARTITIONS INDICATED AS FIRE RESISTANCE RATED. ADVISE THE ARCHITECT OF ANY PRE-EXISTING BREACHES DISCOVERED IN THE COURSE OF WORK.
15. ALL GYPSUM CEILINGS TO BE PAINTED PT-1 U.N.O.

6A / A702 SECOND FLOOR RCP
SCALE: 1/8" = 1'-0"

11/12/2021 11:44:05 AM

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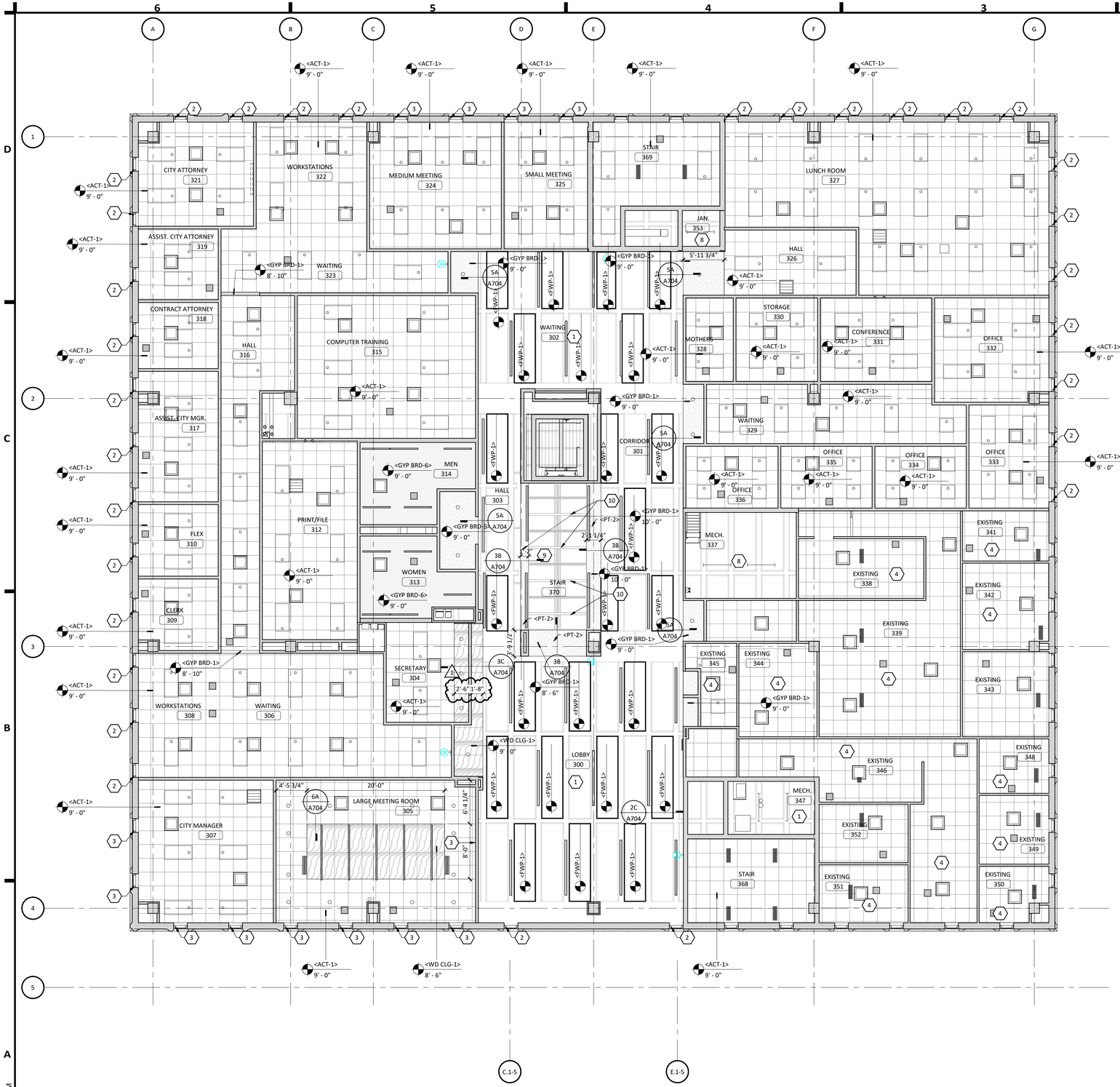
LICENSED ARCHITECT JENNIFER BURKE JACKSON 7369 DATE 1 04 2021 STATE OF NORTH DAKOTA

REVISION SCHEDULE		
NO.	DESCRIPTION	DATE
1	ADDENDUM 1	11/12/21

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A702
SECOND FLOOR RCP



6A / A703 THIRD FLOOR RCP
SCALE: 1/8" = 1'-0"

CEILING PLAN KEYNOTES

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1	EXPOSED STRUCTURE, PAINT <PT-1> U.N.O ON RCP.
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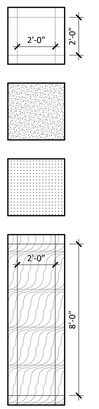
15. ALL GYPSUM CEILINGS TO BE PAINTED PT-1 U.N.O.

RCP LEGEND



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1	ADDENDUM 1	11/12/21

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MINOT, ND

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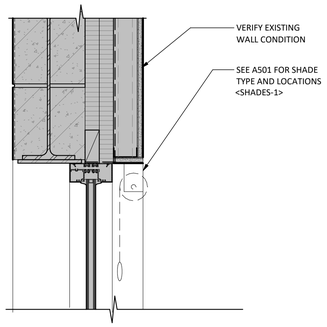
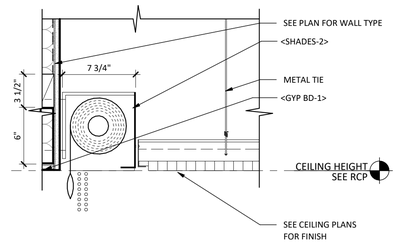
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A703
THIRD FLOOR RCP

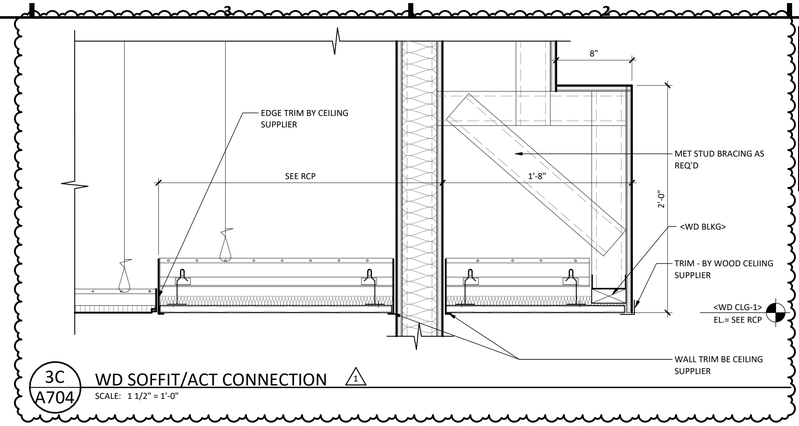
11/12/2021 11:44:11 AM



6D A704 MANUAL SHADE DETAIL
SCALE: 1 1/2" = 1'-0"

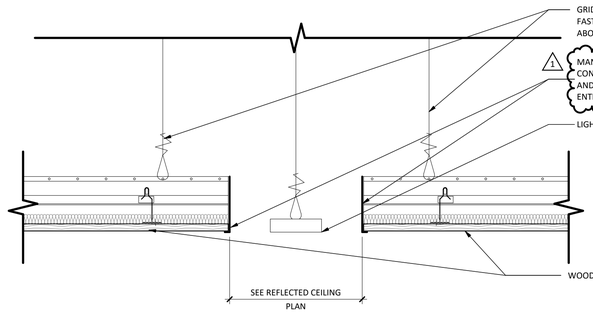


5D A704 ELECTRONIC SHADE DETAIL
SCALE: 1 1/2" = 1'-0"

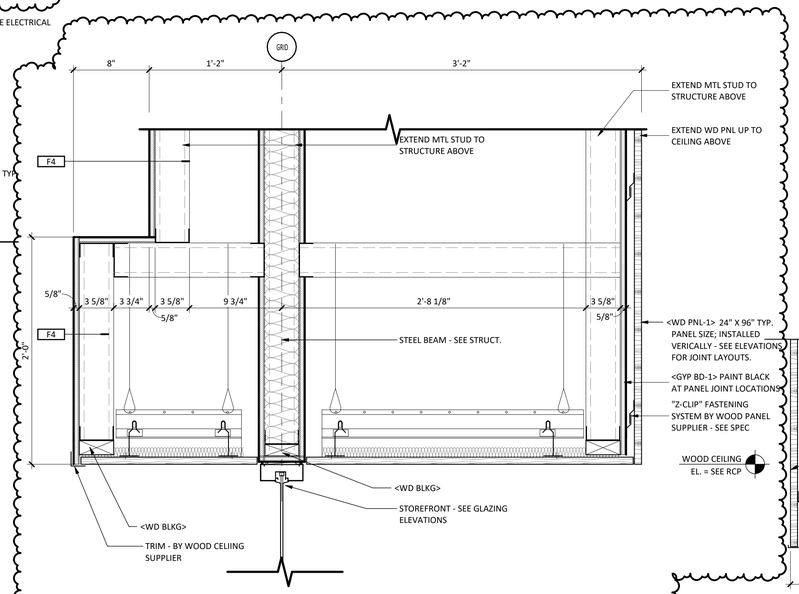


3C A704 WD SOFFIT/ACT CONNECTION 1
SCALE: 1 1/2" = 1'-0"

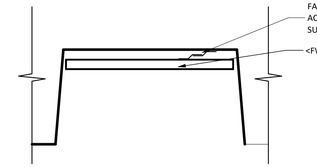
SHEET MATERIAL ID LIST	
MATERIAL ID	**SPEC SECTION & DESCRIPTION**
FWP-1	09 8430 - FABRIC WRAPPED ACOUSTIC PANEL
GYP BD-1	09 2116 - 5/8" TYPE X GYPSUM BOARD
GYP BD-6	09 2116 - 5/8" TYPE X MOLD RESISTANT GYPSUM BOARD
MET STUD-2	09 2116 - NON-LOADBEARING METAL STUDS, 20 GA
SHADES-1	12 2400 - ROLLER SHADES, MANUAL
SHADES-2	12 2400 - ROLLER SHADES, ELECTRIC
WD BLKG	06 1000 - WOOD BLOCKING
WD CLG-1	09 5100 - WOOD CEILING TILE
WD PNL-1	09 5100 - WOOD WALL PANEL



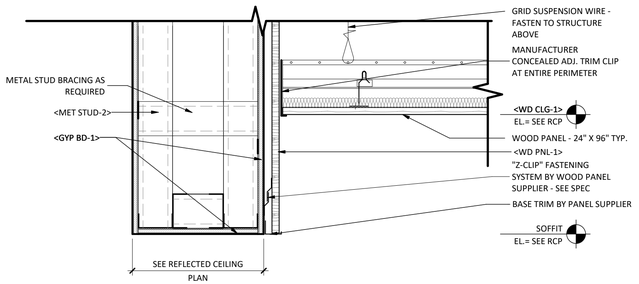
6C A704 WOOD CEILING EDGE
SCALE: 1 1/2" = 1'-0"



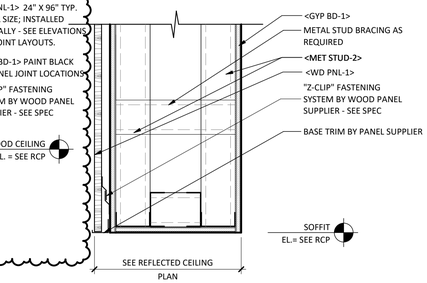
4B A704 STOREFRONT HEAD AT FRONT OF COUNCIL CHAMBER - BASE BID 1
SCALE: 1 1/2" = 1'-0"



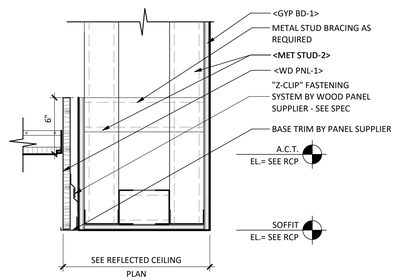
2C A704 ACOUSTIC FABRIC DETAIL
SCALE: 1 1/2" = 1'-0"



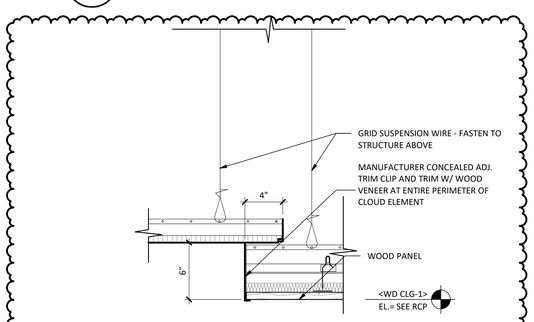
6B A704 SOFFIT/WOOD CEILING CONNECTION
SCALE: 1 1/2" = 1'-0"



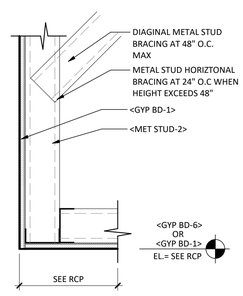
3B A704 GYP/WD SOFFIT CONNECTION
SCALE: 1 1/2" = 1'-0"



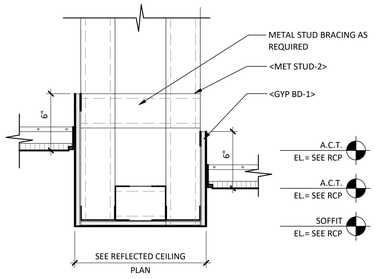
1B A704 1ST FLOOR STAIR SOFFIT DETAIL
SCALE: 1 1/2" = 1'-0"



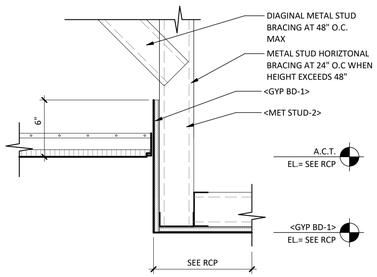
6A A704 ACT/WOOD CEILING CONNECTION 1
SCALE: 1 1/2" = 1'-0"



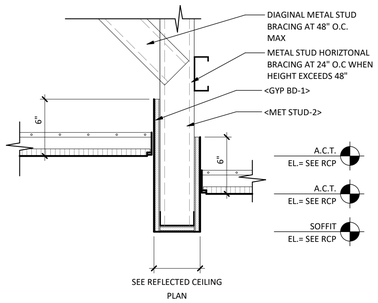
5A A704 SOFFIT DETAIL TO OPEN CEILING
SCALE: 1 1/2" = 1'-0"



4A A704 SOFFIT/ACT CONNECTION
SCALE: 1 1/2" = 1'-0"



3A A704 SOFFIT DETAIL
SCALE: 1 1/2" = 1'-0"



1A A704 BULKHEAD/ACT CONNECTION
SCALE: 1 1/2" = 1'-0"

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JENNIFER BURKE JACKSON
DATE 11 04 2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE		
NO.	**DESCRIPTION**	**DATE**
1	ADDENDUM 1	11/12/21

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019

SHEET A704
CEILING DETAILS

11/12/2021 11:44:15 AM

SIGNAGE SCHEDULE

ROOM NUMBER	SIGN TYPE	MESSAGE	NOTES
FIRST FLOOR			
--	4F	TBD; SEE DETAILS FOR TYP.	LOCATED BY ELEVATOR
--	4F	TBD; SEE DETAILS FOR TYP.	LOCATED BY ELEVATOR
100	4A	TBD; SEE DETAILS FOR TYP.	
103	1A	TBD; SEE DETAILS FOR TYP.	
104	1A	TBD; SEE DETAILS FOR TYP.	
106	1A	TBD; SEE DETAILS FOR TYP.	
108	1B	TBD; SEE DETAILS FOR TYP.	
109	1B	TBD; SEE DETAILS FOR TYP.	
112	1E	TBD; SEE DETAILS FOR TYP.	
115	1C	TBD; SEE DETAILS FOR TYP.	
116	1E	TBD; SEE DETAILS FOR TYP.	
117	1C	TBD; SEE DETAILS FOR TYP.	
119	1A	TBD; SEE DETAILS FOR TYP.	
121	1C	TBD; SEE DETAILS FOR TYP.	
122	1A	TBD; SEE DETAILS FOR TYP.	
123	4A	TBD; SEE DETAILS FOR TYP.	
125	1E	TBD; SEE DETAILS FOR TYP.	
125	1E	TBD; SEE DETAILS FOR TYP.	
126	1E	TBD; SEE DETAILS FOR TYP.	
128	1A	TBD; SEE DETAILS FOR TYP.	
128	1A	TBD; SEE DETAILS FOR TYP.	
131	1E	TBD; SEE DETAILS FOR TYP.	
132	1A	TBD; SEE DETAILS FOR TYP.	
133	1D	TBD; SEE DETAILS FOR TYP.	
134	1C	TBD; SEE DETAILS FOR TYP.	
135	1C	TBD; SEE DETAILS FOR TYP.	
136	1C	TBD; SEE DETAILS FOR TYP.	
137	1C	TBD; SEE DETAILS FOR TYP.	
138	1C	TBD; SEE DETAILS FOR TYP.	
139	1C	TBD; SEE DETAILS FOR TYP.	
141	1C	TBD; SEE DETAILS FOR TYP.	
142	1E	TBD; SEE DETAILS FOR TYP.	
143	1B	TBD; SEE DETAILS FOR TYP.	
144	1B	TBD; SEE DETAILS FOR TYP.	
146	1E	TBD; SEE DETAILS FOR TYP.	
147	1E	TBD; SEE DETAILS FOR TYP.	
148	1A (2)	TBD; SEE DETAILS FOR TYP.	
149	1D	TBD; SEE DETAILS FOR TYP.	
151	1E	TBD; SEE DETAILS FOR TYP.	
152	1C	TBD; SEE DETAILS FOR TYP.	
153	1C	TBD; SEE DETAILS FOR TYP.	
154	1C	TBD; SEE DETAILS FOR TYP.	
SECOND FLOOR			
254	4A	TBD; SEE DETAILS FOR TYP.	
256	4A	TBD; SEE DETAILS FOR TYP.	
249	1A	TBD; SEE DETAILS FOR TYP.	
--	4F	TBD; SEE DETAILS FOR TYP.	LOCATED BY ELEVATOR
205	5B	TBD; SEE DETAILS FOR TYP.	
248	5C	TBD; SEE DETAILS FOR TYP.	
246	5D	TBD; SEE DETAILS FOR TYP.	
--	4F	TBD; SEE DETAILS FOR TYP.	LOCATED BY ELEVATOR
201	4E	TBD; SEE DETAILS FOR TYP.	
202	4E	TBD; SEE DETAILS FOR TYP.	
205	1A	TBD; SEE DETAILS FOR TYP.	
205	1A	TBD; SEE DETAILS FOR TYP.	
205	1A	TBD; SEE DETAILS FOR TYP.	
206	1A	TBD; SEE DETAILS FOR TYP.	
206	1A	TBD; SEE DETAILS FOR TYP.	
208	1C	TBD; SEE DETAILS FOR TYP.	
211	1C	TBD; SEE DETAILS FOR TYP.	
212	1C	TBD; SEE DETAILS FOR TYP.	
213	1C	TBD; SEE DETAILS FOR TYP.	
214	1C	TBD; SEE DETAILS FOR TYP.	
216	1C	TBD; SEE DETAILS FOR TYP.	
217	1C	TBD; SEE DETAILS FOR TYP.	
218	1C	TBD; SEE DETAILS FOR TYP.	
219	1A	TBD; SEE DETAILS FOR TYP.	
220	1B	TBD; SEE DETAILS FOR TYP.	
221	1B	TBD; SEE DETAILS FOR TYP.	
223 (2)	1A	TBD; SEE DETAILS FOR TYP.	
224	1E	TBD; SEE DETAILS FOR TYP.	
225	1B	TBD; SEE DETAILS FOR TYP.	
226	1A	TBD; SEE DETAILS FOR TYP.	
227	1A	TBD; SEE DETAILS FOR TYP.	
227	1E	TBD; SEE DETAILS FOR TYP.	
231	1C	TBD; SEE DETAILS FOR TYP.	
232	1C	TBD; SEE DETAILS FOR TYP.	
233	1C	TBD; SEE DETAILS FOR TYP.	
234	1C	TBD; SEE DETAILS FOR TYP.	
235	1A	TBD; SEE DETAILS FOR TYP.	
235	1A	TBD; SEE DETAILS FOR TYP.	
236	1E	TBD; SEE DETAILS FOR TYP.	
237	1C	TBD; SEE DETAILS FOR TYP.	
238	1C	TBD; SEE DETAILS FOR TYP.	
241	1A	TBD; SEE DETAILS FOR TYP.	
242	1A	TBD; SEE DETAILS FOR TYP.	
242	1A	TBD; SEE DETAILS FOR TYP.	
243	1E	TBD; SEE DETAILS FOR TYP.	
244	1C	TBD; SEE DETAILS FOR TYP.	
244 (2)	1C	TBD; SEE DETAILS FOR TYP.	
245	1C	TBD; SEE DETAILS FOR TYP.	
246	1A	TBD; SEE DETAILS FOR TYP.	
246	1A	TBD; SEE DETAILS FOR TYP.	
246	1A	TBD; SEE DETAILS FOR TYP.	
246	2A	TBD; SEE DETAILS FOR TYP.	
247	1E	TBD; SEE DETAILS FOR TYP.	
251	1C	TBD; SEE DETAILS FOR TYP.	
252	1C	TBD; SEE DETAILS FOR TYP.	
253	1E	TBD; SEE DETAILS FOR TYP.	

SIGNAGE SCHEDULE

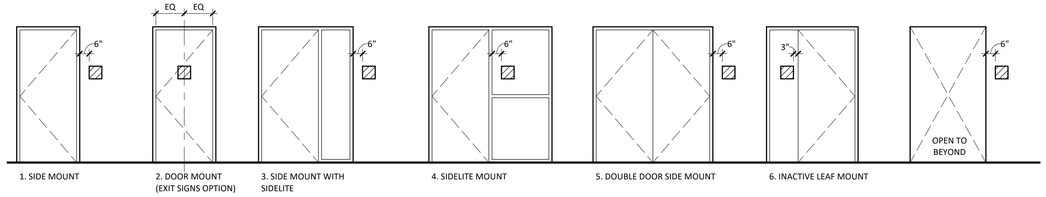
ROOM NUMBER	SIGN TYPE	MESSAGE	NOTES
THIRD FLOOR			
--	4F	TBD; SEE DETAILS FOR TYP.	LOCATED BY ELEVATOR
--	1A	TBD; SEE DETAILS FOR TYP.	LOCATED BY DOOR 339
368	4A	TBD; SEE DETAILS FOR TYP.	
--	5E	TBD; SEE DETAILS FOR TYP.	LOCATED ON SOUTH EXTERIOR CANOPY
--	4F	TBD; SEE DETAILS FOR TYP.	LOCATED BY ELEVATOR
304 (2)	5A	TBD; SEE DETAILS FOR TYP.	
300	4A	TBD; SEE DETAILS FOR TYP.	
304	1A	TBD; SEE DETAILS FOR TYP.	
305	1A	TBD; SEE DETAILS FOR TYP.	
305	1A	TBD; SEE DETAILS FOR TYP.	
306	1A	TBD; SEE DETAILS FOR TYP.	
307	1C	TBD; SEE DETAILS FOR TYP.	
309	1C	TBD; SEE DETAILS FOR TYP.	
310	1C	TBD; SEE DETAILS FOR TYP.	
312	1A	TBD; SEE DETAILS FOR TYP.	
312	1A	TBD; SEE DETAILS FOR TYP.	
313	1B	TBD; SEE DETAILS FOR TYP.	
314	1B	TBD; SEE DETAILS FOR TYP.	
315	1A	TBD; SEE DETAILS FOR TYP.	
317	1C	TBD; SEE DETAILS FOR TYP.	
318	1C	TBD; SEE DETAILS FOR TYP.	
319	1C	TBD; SEE DETAILS FOR TYP.	
321	1C	TBD; SEE DETAILS FOR TYP.	
323	1A	TBD; SEE DETAILS FOR TYP.	
324	1A	TBD; SEE DETAILS FOR TYP.	
324	1A	TBD; SEE DETAILS FOR TYP.	
325	1A	TBD; SEE DETAILS FOR TYP.	
326	4E	TBD; SEE DETAILS FOR TYP.	
327	1A	TBD; SEE DETAILS FOR TYP.	
327	1A	TBD; SEE DETAILS FOR TYP.	
328	1A	TBD; SEE DETAILS FOR TYP.	
329	1A	TBD; SEE DETAILS FOR TYP.	
330	1E	TBD; SEE DETAILS FOR TYP.	
331	1A	TBD; SEE DETAILS FOR TYP.	
332	1C	TBD; SEE DETAILS FOR TYP.	
333	1C	TBD; SEE DETAILS FOR TYP.	
334	1C	TBD; SEE DETAILS FOR TYP.	
335	1C	TBD; SEE DETAILS FOR TYP.	
336	1C	TBD; SEE DETAILS FOR TYP.	
337	1E	TBD; SEE DETAILS FOR TYP.	
353	1E	TBD; SEE DETAILS FOR TYP.	

1

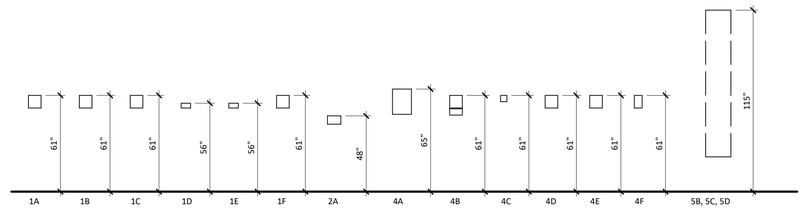
SIGNAGE PLAN NOTES

- INDICATES SIGN LOCATION AND TYPE; SEE SIGNAGE SCHEDULE FOR TYPE AND MESSAGE REQUIREMENTS

A. SEE MOUNTING SCHEDULE FOR SIGNAGE MOUNTING LOCATION AND HEIGHT
B. SEE SPECIFICATION FOR ADDITIONAL SIGNAGE LOCATION REQUIREMENTS
C. CONTRACTOR TO PROVIDE FIRE TREATED WOOD BLOCKING IN WALL OR CEILING ASSEMBLY AS REQUIRED FOR MOUNTING OF SIGNAGE
D. ROOM NUMBERS AND NAMES MAY NOT ALIGN WITH THOSE INDICATED IN THE CONSTRUCTION FLOOR PLANS. VERIFY ALL NUMBERING AND MESSAGE WITH ARCHITECT PRIOR TO PRODUCTION.
E. SEE EXTERIOR BUILDING ELEVATIONS/LANDSCAPE DRAWINGS FOR EXTERIOR SIGNAGE LOCATIONS.



OPENING SIGNAGE LOCATIONS



SIGN MOUNTING HEIGHTS

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REVISION SCHEDULE

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	11/12/21
2	ADDENDUM 2	11/18/21

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE
11/04/21
PHASE
CONSTRUCTION DOCUMENTS
PROJECT
21019
SHEET
A820
SIGNAGE SCHEDULE

11/18/2021 9:15:54 PM

SIGNAGE PLAN NOTES

- INDICATES SIGN LOCATION AND TYPE; SEE SIGNAGE SCHEDULE FOR TYPE AND MESSAGE REQUIREMENTS

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E. SEE EXTERIOR BUILDING ELEVATIONS/LANDSCAPE DRAWINGS FOR EXTERIOR SIGNAGE LOCATIONS.

SIGNAGE KEYNOTES

KEYNOTE	DESCRIPTION
01	PROVIDE (50) NAMEPLATE SIGNAGE 2A, MOUNTED TO FACE OF CURVE COUNTERTOP.

VESTIBULE 100
EXISTING TENANT 102
LOBBY 101
STAIR 145
SERVER 149
STORAGE 151
OFFICE 152
OFFICE 153
JANITOR 146
TENANT 148
OFFICE 154
TLT. 144
TLT. 143
STORAGE 147
RADIO ROOM 103
HALL 105
STOR. 142
OFFICE 141
OFFICE 139
OFFICE 138
STAIR 129
HALL 128
MEETING 132
OFFICE 137
CONFERENCE ROOM 106
MECH. 131
SERVER 133
OFFICE 134
OFFICE 135
OFFICE 136
DISPATCH CONSOLES 104
VESTIBULE 107
HALL 114
CUST. 125
TLT. 108
LOCKERS 110
HALL 113
ASSIST. PSAP MANAGER 115
HALL 118
BREAKROOM 119
JAN. 126
BOILER 127
TLT./SHOWER 109
STORAGE 116
PSAP MANAGER 121
HALL 123
TRANSFORMER 111
ELECT. 112
DECOMPRESS 117
HALL 122
STAIR 124
C.1-5
E.1-5

6A A821 FIRST FLOOR - SIGNAGE PLAN
SCALE: 1/8" = 1'-0"

11/18/2021 9:15:58 PM

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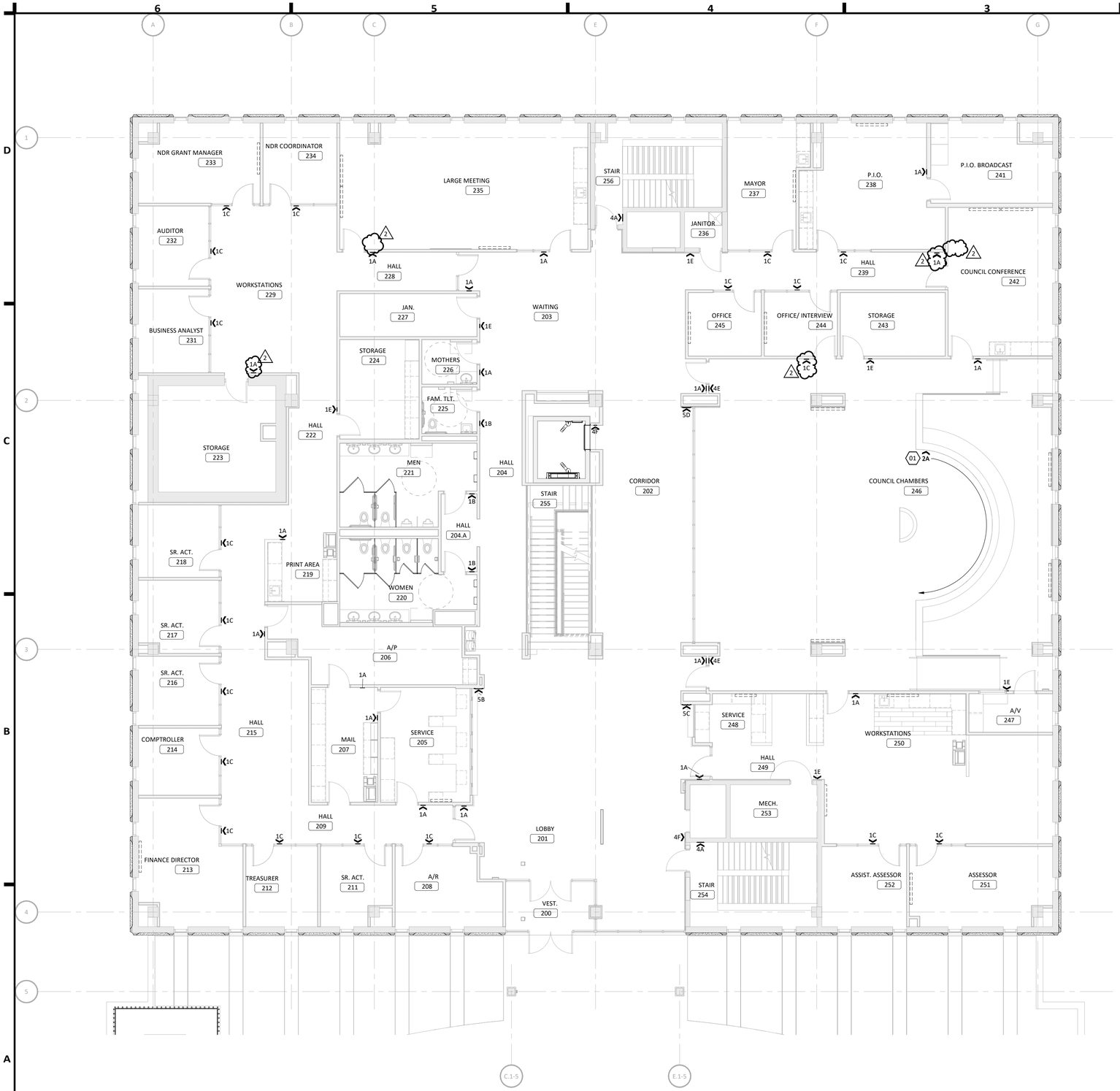
LICENSED ARCHITECT JENNIFER BURKE JACKSON 2366 DATE 11-04-2021 STATE OF NORTH DAKOTA

REVISION SCHEDULE

NO.	DESCRIPTION	DATE
2	ADDENDUM 2	11/18/21

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A821
FIRST FLOOR SIGNAGE PLAN



SIGNAGE PLAN NOTES

- INDICATES SIGN LOCATION AND TYPE; SEE SIGNAGE SCHEDULE FOR TYPE AND MESSAGE REQUIREMENTS

A. SEE MOUNTING SCHEDULE FOR SIGNAGE MOUNTING LOCATION AND HEIGHT
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E. SEE EXTERIOR BUILDING ELEVATIONS/LANDSCAPE DRAWINGS FOR EXTERIOR SIGNAGE LOCATIONS.

SIGNAGE KEYNOTES

KEYNOTE	DESCRIPTION
01	PROVIDE (50) NAMEPLATE SIGNAGE 2A, MOUNTED TO FACE OF CURVE COUNTERTOP.

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NO.	DESCRIPTION	DATE
2	ADDENDUM 2	11/18/21

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A822
SECOND FLOOR SIGNAGE PLAN

6A A822 SECOND FLOOR SIGNAGE PLAN
SCALE: 1/8" = 1'-0"

11/18/2021 9:16:03 PM

SIGNAGE PLAN NOTES

##
- INDICATES SIGN LOCATION AND TYPE; SEE SIGNAGE SCHEDULE FOR TYPE AND MESSAGE REQUIREMENTS

A. SEE MOUNTING SCHEDULE FOR SIGNAGE MOUNTING LOCATION AND HEIGHT
B. SEE SPECIFICATION FOR ADDITIONAL SIGNAGE LOCATION REQUIREMENTS
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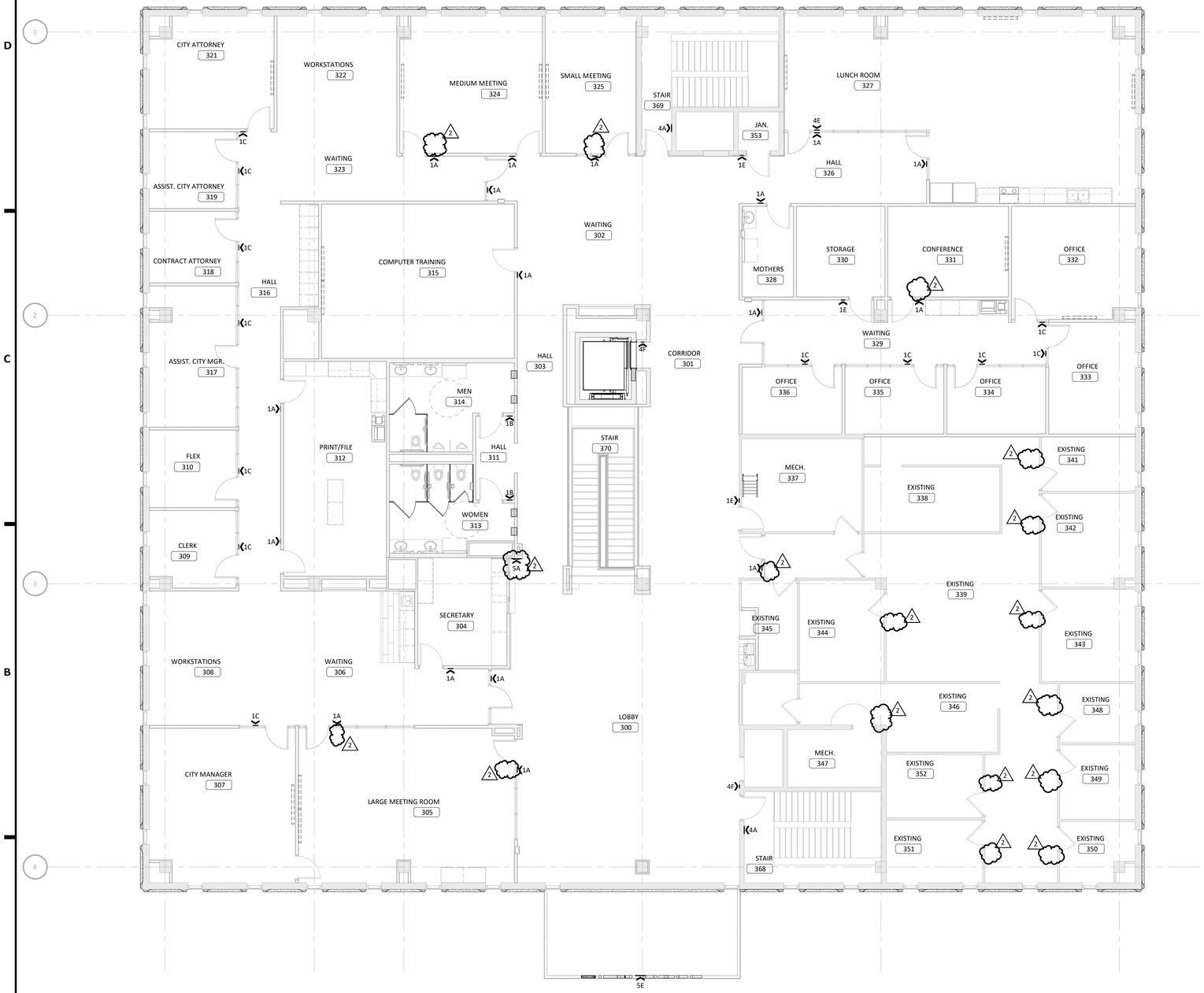
SIGNAGE KEYNOTES

KEYNOTE	DESCRIPTION
01	PROVIDE (50) NAMEPLATE SIGNAGE 2A, MOUNTED TO FACE OF CURVE COUNTERTOP.



6A
A823
THIRD FLOOR SIGNAGE PLAN
SCALE: 1/8" = 1'-0"

11/18/2021 9:16:08 PM

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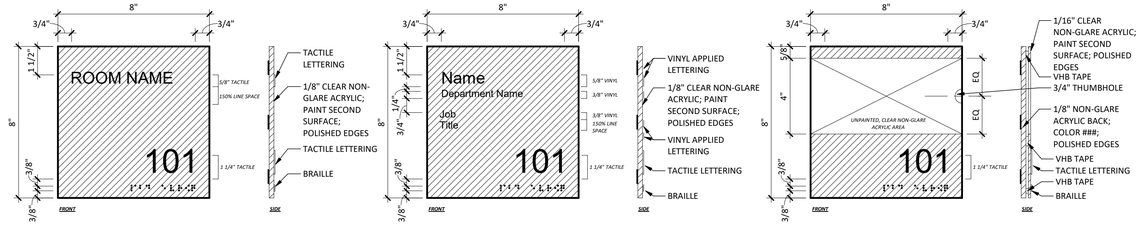
REVISION SCHEDULE

NO.	DESCRIPTION	DATE
2	ADDENDUM 2	11/18/21

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

CITY PROJECT 4466
DATE
11/04/21
PHASE
CONSTRUCTION DOCUMENTS
PROJECT
21019
SHEET
A823
THIRD FLOOR SIGNAGE PLAN

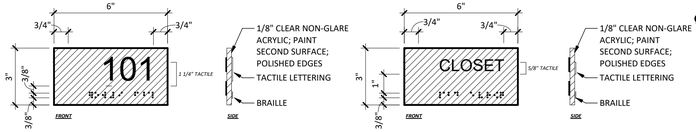
ROOM SIGNAGE - '1' SERIES



1A - ROOM ID WITH PERMANENT INFORMATION

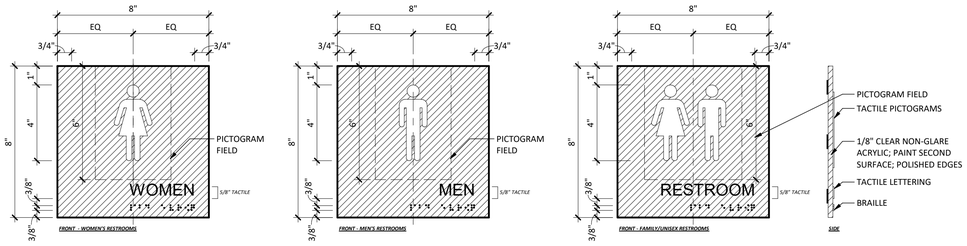
1B - ROOM ID W/ SEMI-PERMANENT INFORMATION

1C - ROOM ID W/ CLEAR AREA TO HOLD 4.25"X8.5" PAPER INSERT



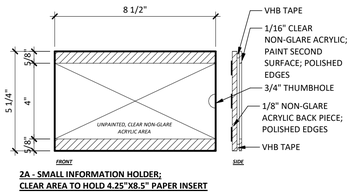
1D - SMALL ROOM ID NUMBER

1E - SMALL ROOM ID NAME



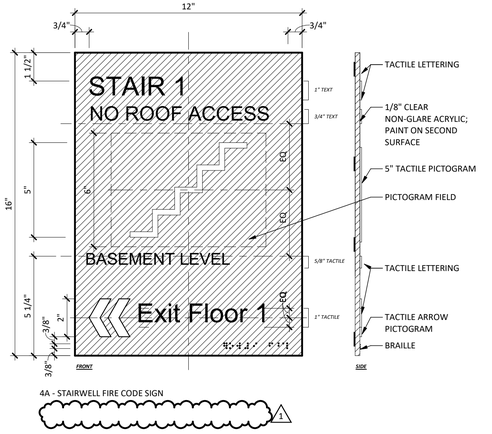
1B - 1F RESTROOM IDENTIFICATION

ROOM INFORMATION SIGNAGE - '2' SERIES

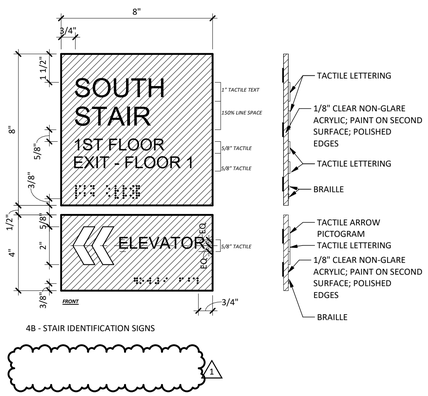


2A - SMALL INFORMATION HOLDER;
CLEAR AREA TO HOLD 4.25"X8.5" PAPER INSERT

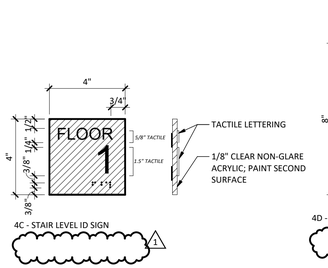
CODE REQUIRED SIGNAGE - '4' SERIES



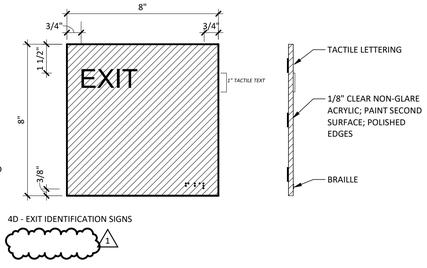
4A - STAIRWELL FIRE CODE SIGN



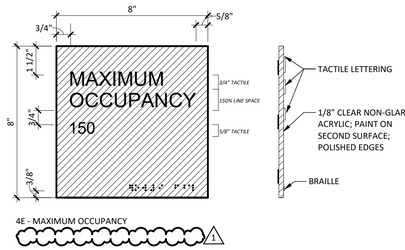
4B - STAIR IDENTIFICATION SIGNS



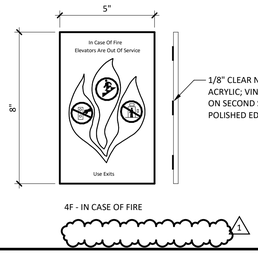
4C - STAIR LEVEL ID SIGN



4D - EXIT IDENTIFICATION SIGNS



4E - MAXIMUM OCCUPANCY



4F - IN CASE OF FIRE

SIGNAGE GENERAL NOTES

- COLOR #1 - PANTONE ######

1. ALL FONT AND PICTOGRAMS TO BE PANTONE ##### UNLESS NOTED OTHERWISE
2. ALL VINYL APPLIED SIGNAGE FONT TO BE PANTONE ##### UNLESS NOTED OTHERWISE
3. FONT DISPLAYED IN SIGNAGE TYPES IS FOR REFERENCE ONLY; SEE SIGNAGE SCHEDULE FOR LETTERING REQUIREMENTS; ALL LETTERING TO BE VERIFIED PRIOR TO PRODUCTION OF SIGNAGE.
4. ALL FONT TO BE 'Helvetica' FONTFACE UNLESS NOTED OTHERWISE.
5. CONTRACTOR TO PROVIDE FIRE TREATED BLOCKING IN WALLS AND CEILINGS AS REQUIRED FOR MOUNTING OF SIGNAGE.
6. ACRYLIC SIGNAGE TO BE SURFACE MOUNTED WITH GRAY VHB TAPE AS REQUIRED UNLESS NOTED OTHERWISE.
7. SEE EXTERIOR ELEVATIONS/LANDSCAPE DRAWING SERIES FOR EXTERIOR SIGNAGE REQUIREMENTS
8. VISUAL CHARACTERS SHALL BE UPPERCASE, LOWER CASE, OR A COMBINATION OF BOTH.
9. VISUAL CHARACTERS SHALL BE CONVENTIONAL IN FORM. CHARACTERS SHALL NOT BE ITALIC, OBLIQUE, SCRIPT, HIGHLY DECORATIVE, OR OTHER UNUSUAL FORMS.
10. FOR VISUAL CHARACTERS THE UPPERCASE LETTER 'I' SHALL BE USED TO DETERMINE THE ALLOWABLE HEIGHT OF ALL CHARACTERS OF A FONT. THE UPPERCASE LETTER 'I' OF THE FONT SHALL HAVE A THE FOLLOWING MINIMUMS RELATIVE TO HORIZONTAL VIEWING DISTANCE (HVD) AND VERTICAL MOUNTING HEIGHT (VMH):
    -VMH 40-70" + HVD<6'-0" = 5/8" + 1/8" PER FOOT OF HVD ABOVE 6'-0".
    -VMH 70-120" + HVD<15'-0" = 2" + 1/8" PER FOOT OF HVD ABOVE 15'-0".
    -VMH >120" + HVD<21'-0" = 3" + 1/8" PER FOOT OF HVD ABOVE 21'-0".
    -FOR ASSEMBLY SEATING WHERE THE MAXIMUM VIEWING DISTANCE IS 100'-0" OR GREATER, THE HEIGHT OF THE UPPERCASE 'I' OF FONTS SHALL BE PERMITTED TO BE 1 INCH FOR EVERY 30'-0" OF VIEWING DISTANCE PROVIDED THE HEIGHT IS 8 INCHES MINIMUM. VIEWING DISTANCE SHALL BE MEASURED AS THE HORIZONTAL DISTANCE BETWEEN THE CHARACTER AND WHERE SOMEONE IS EXPECTED TO VIEW THE SIGN.
11. FOR VISUAL CHARACTERS THE UPPERCASE LETTER 'O' SHALL BE USED TO DETERMINE THE ALLOWABLE WIDTH OF AL CHARACTERS OF A FONT. THE WIDTH OF THE UPPERCASE LETTER 'O' OF THE FONT SHALL BE 55% MINIMUM AND 110% MAXIMUM OF THE HEIGHT OF THE UPPERCASE 'I' OF THE FONT.
12. FOR VISUAL CHARACTERS THE UPPERCASE LETTER 'I' SHALL BE USED TO DETERMINE THE ALLOWABLE STROKE WIDTH OF ALL CHARACTERS OF A FONT. THE STROKE WIDTH SHALL BE 10% MINIMUM AND 30% MAXIMUM OF THE HEIGHT OF THE UPPERCASE 'I' OF THE FONT.
13. SPACING SHALL BE MEASURED BETWEEN THE TWO CLOSEST POINTS OF ADJACENT CHARACTERS WITHIN A MESSAGE, EXCLUDING WORD SPACES. SPACING BETWEEN INDIVIDUAL CHARACTERS SHALL BE 10% MINIMUM AND 35% MAXIMUM OF THE CHARACTER HEIGHT.
14. FOR VISUAL CHARACTERS, SPACING BETWEEN THE BASELINES OF SEPARATE LINES OF CHARACTERS WITHIN A MESSAGE SHALL BE 135% MINIMUM AND 170% MAXIMUM OF THE CHARACTER HEIGHT.
15. VISUAL CHARACTERS SHALL BE 40" MINIMUM ABOVE THE FLOOR OF THE VIEWING POSITION MEASURED TO THE BASELINE OF THE CHARACTER.
16. VISUAL CHARACTERS AND THEIR BACKGROUND SHALL HAVE A NON-GLARE FINISH. CHARACTERS SHALL CONTRAST WITH THEIR BACKGROUND, WITH EITHER LIGHT CHARACTERS ON A DARK BACKGROUND, OR DARK CHARACTERS ON A LIGHT BACKGROUND.
17. FOR RAISED CHARACTERS THE UPPERCASE LETTER I SHALL BE USED TO DETERMINE THE ALLOWABLE HEIGHT OF ALL CHARACTERS OF A FONT. THE HEIGHT OF THE UPPERCASE LETTER 'I' OF THE FONT, MEASURED VERTICALLY FROM THE BASELINE OF THE CHARACTER SHALL BE 5/8" MINIMUM AND 2" MAXIMUM.
18. FOR RAISED CHARACTERS THE UPPERCASE LETTER 'O' SHALL BE USED TO DETERMINE THE ALLOWABLE WIDTH OF ALL CHARACTERS IN A FONT. THE WIDTH OF THE UPPERCASE LETTER 'O' OF THE FONT SHALL BE 55% MINIMUM AND 110% MAXIMUM OF THE HEIGHT OF THE UPPERCASE 'I' IN THE FONT.
19. FOR RAISED CHARACTERS THE UPPERCASE LETTER 'I' OF THE FONT SHALL BE USED TO DETERMINE THE ALLOWABLE STROKE WIDTH OF ALL CHARACTERS OF A FONT. THE STROKE WIDTH SHALL BE 15% MAXIMUM OF THE HEIGHT OF THE UPPERCASE LETTER 'I' MEASURED AT THE TOP SURFACE OF THE CHARACTER, AND 30% MAXIMUM OF THE HEIGHT OF THE UPPERCASE LETTER 'I' MEASURED AT THE BASE OF THE CHARACTER. WHEN CHARACTERS ARE BOTH VISUAL AND RAISED, THE STROKE WIDTH SHALL BE 10% MINIMUM OF THE HEIGHT OF THE UPPERCASE LETTER 'I'.
20. CHARACTER SPACING SHALL BE MEASURED BETWEEN THE TWO CLOSEST POINTS OF ADJACENT RAISED CHARACTERS WITHIN A MESSAGE, EXCLUDING WORD SPACES. SPACING BETWEEN INDIVIDUAL RAISED CHARACTERS SHALL BE 1/8" MINIMUM MEASURED AT THE TOP SURFACE OF THE CHARACTERS, 1/16" MINIMUM MEASURED AT THE BASE OF THE CHARACTER, AND FOUR TIMES THE RAISED CHARACTER STROKE WIDTH MAXIMUM. CHARACTERS SHALL BE SEPARATED FROM RAISED BORDERS AND DECORATIVE ELEMENTS 3/8" MINIMUM.
21. SPACING BETWEEN THE BASELINES OF SEPARATE LINES OF RAISED CHARACTERS WITHIN A MESSAGE SHALL BE 135% MINIMUM AND 170% PERCENT MAXIMUM OF THE RAISED CHARACTER HEIGHT.
22. RAISED CHARACTERS/BRAILLE SHALL BE 48" MINIMUM ABOVE THE FLOOR, MEASURED TO THE BASELINE OF THE LOWEST RAISED CHARACTER/BRAILLE AND 60" MAXIMUM ABOVE THE FLOOR MEASURED TO THE BASELINE OF THE HIGHEST RAISED CHARACTER.
23. WHERE A SIGN CONTAINING RAISED CHARACTERS AND BRAILLE IS PROVIDED AT A DOOR, THE SIGN SHALL BE ALONGSIDE THE DOOR AT THE LATCH SIDE. WHERE A SIGN CONTAINING RAISED CHARACTERS AND BRAILLE IS PROVIDED AT DOUBLE DOORS WITH ONE ACTIVE LEAF, THE SIGN SHALL BE LOCATED ON THE INACTIVE LEAF. WHERE A SIGN CONTAINING RAISED CHARACTERS AND BRAILLE IS PROVIDED AT DOUBLE DOORS WITH TWO ACTIVE LEAVES, THE SIGN SHALL BE TO THE RIGHT OF THE RIGHT-HAND DOOR. WHERE THERE NO WALL SPACE ON THE LATCH SIDE OF A SINGLE DOOR, OR TO THE RIGHT SIDE OF DOUBLE DOORS, SIGNS SHALL BE ON THE NEAREST ADJACENT WALL. SIGNS CONTAINING RAISED CHARACTERS AND BRAILLE SHALL BE LOCATED SO THAT A CLEAR FLOOR AREA 18"X18" MINIMUM, CENTERED ON THE RAISED CHARACTERS IS PROVIDED BEYOND THE ARC OF ANY DOOR SWING BETWEEN THE CLOSED POSITION AND 45 DEGREE POSITION.
24. CHARACTERS AND THEIR BACKGROUND SHALL HAVE A NON-GLARE FINISH. CHARACTERS SHALL CONTRAST WITH THEIR BACKGROUND WITH EITHER LIGHT CHARACTERS ON A DARK BACKGROUND, OR DARK CHARACTERS ON A LIGHT BACKGROUND.
25. BRAILLE SHALL BE CONTRACTED (GRADE II) BRAILLE.
26. FOR BRAILLE THE INDICATION OF AN UPPERCASE LETTER OR LETTERS SHALL ONLY BE USED BEFORE THE FIRST WORD OF SENTENCES, PROPER NOUNS AND NAMES, INDIVIDUAL LETTERS OF THE ALPHABET, INITIALS OR ACRONYMS.
27. BRAILLE DOTS SHALL HAVE A DOMED OR ROUNDED SHAPE.
28. BRAILLE SHALL BE BELOW THE CORRESPONDING TEXT. IF TEXT IS MULTI LINED, BRAILLE SHALL BE PLACED BELOW ENTIRE TEXT. BRAILLE SHALL BE SEPARATED 3/8" MINIMUM FROM ANY OTHER RAISED CHARACTERS AND 3/8" MINIMUM FROM RAISED BORDERS AND DECORATIVE ELEMENTS. BRAILLE PROVIDED ON ELEVATOR CAR CONTROLS SHALL BE SEPARATED 3/16" MINIMUM EITHER DIRECTLY BELOW OR ADJACENT TO THE CORRESPONDING RAISED CHARACTERS OR SYMBOLS.
29. PICTOGRAMS SHALL HAVE A FIELD 6" MINIMUM IN HEIGHT. CHARACTERS OR BRAILLE SHALL NOT BE LOCATED IN THE PICTOGRAM FIELD.
30. PICTOGRAMS AND THEIR FIELDS SHALL HAVE A NON-GLARE FINISH. PICTOGRAMS SHALL CONTRAST WITH THEIR FIELDS, WITH EITHER A LIGHT PICTOGRAM ON A DARK FIELD OR A DARK PICTOGRAM ON A LIGHT FIELD.

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facsimile 7 0 1 2 5 5 1 6 3 7
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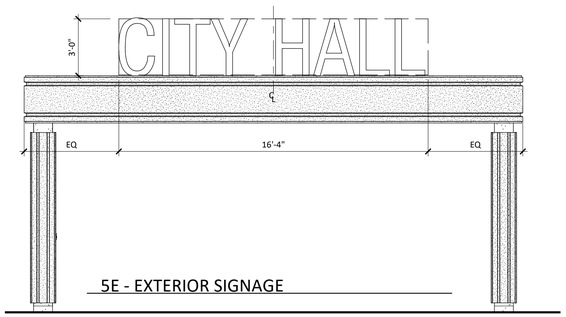
LICENSED ARCHITECT
JENNIFER BURKE JACKSON
DATE 1 04 2021
STATE OF NORTH DAKOTA

REVISION SCHEDULE		
NO.	DESCRIPTION	DATE
1	ADDENDUM 1	11/12/21

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

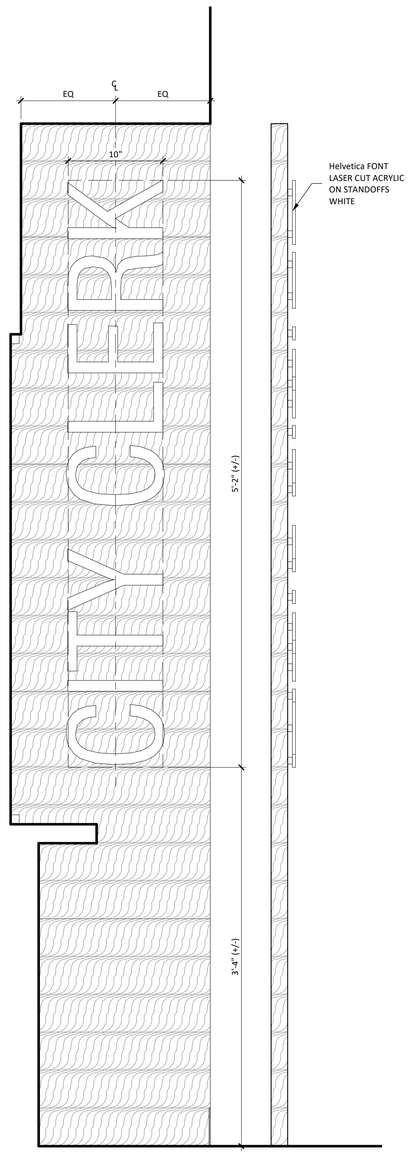
CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET A824
SIGNAGE DETAILS

11/12/2021 11:44:19 AM

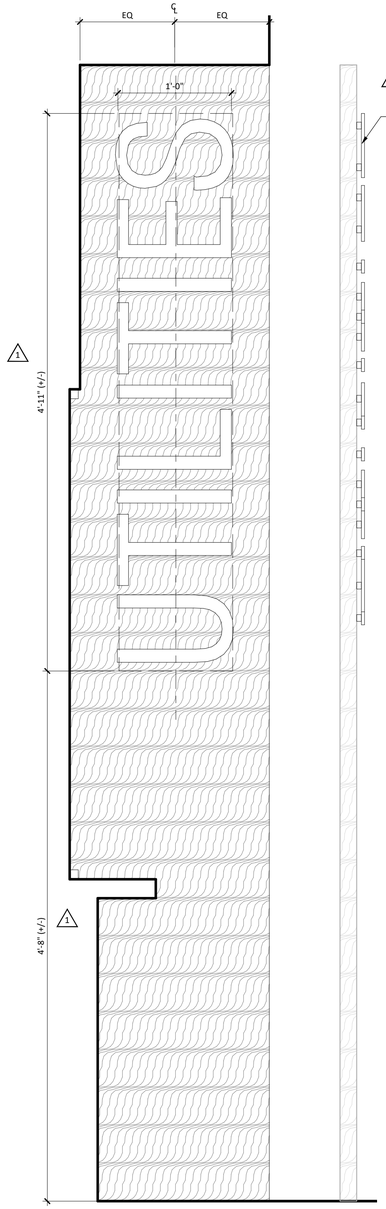


5E - EXTERIOR SIGNAGE

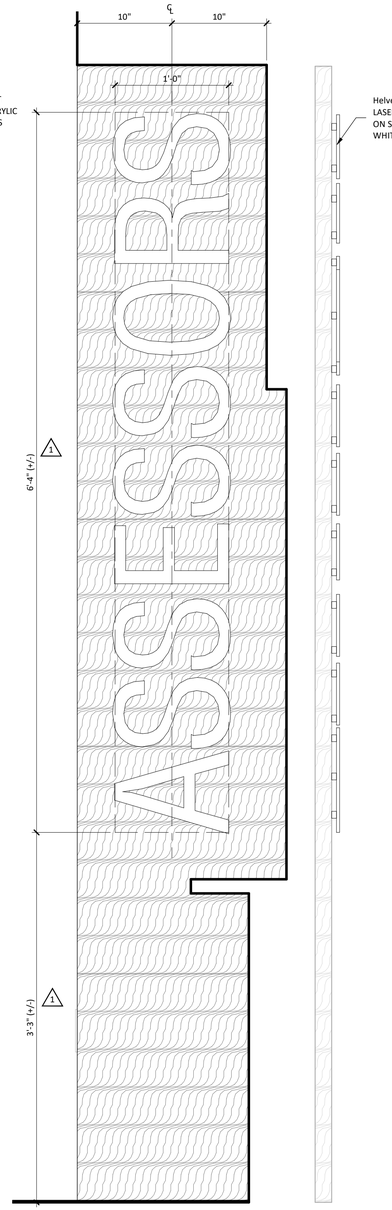
LARGE SIGNAGE - '5' SERIES



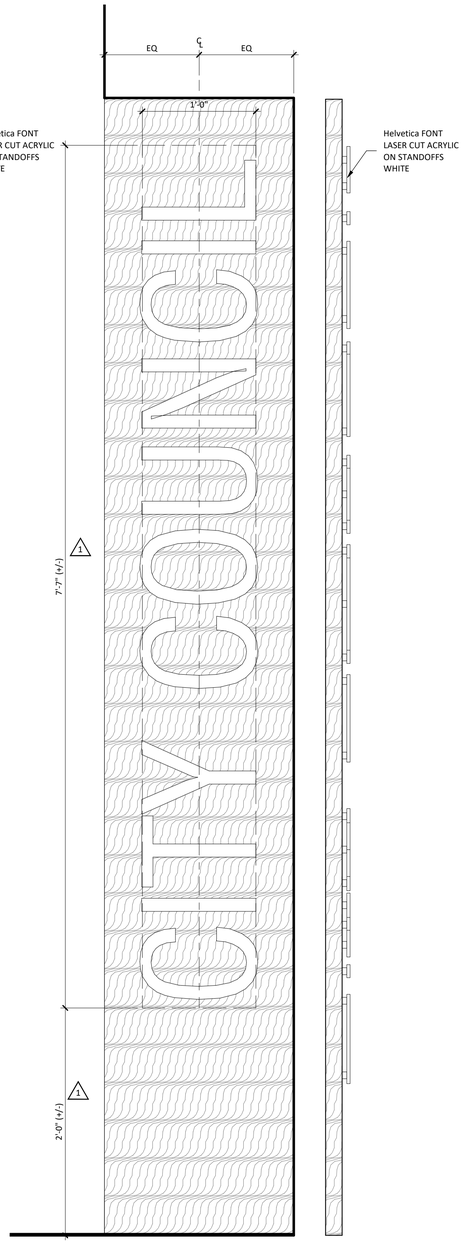
5A - VERTICAL SIGNAGE



5B - VERTICAL SIGNAGE



5C - VERTICAL SIGNAGE



5D - VERTICAL SIGNAGE

SIGNAGE GENERAL NOTES

- COLOR #1 - PANTONE #######

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2. ALL VINYL APPLIED SIGNAGE FONT TO BE PANTONE ##### UNLESS NOTED OTHERWISE
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    -VMH 70-120" + HVD<15'-0" = 2" + 1/8" PER FOOT OF HVD ABOVE 15'-0".
    -VMH >120" + HVD<21'-0" = 3" + 1/8" PER FOOT OF HVD ABOVE 21'-0".
    -FOR ASSEMBLY SEATING WHERE THE MAXIMUM VIEWING DISTANCE IS 100'-0" OR GREATER, THE HEIGHT OF THE UPPERCASE 'I' OF FONTS SHALL BE PERMITTED TO BE 1 INCH FOR EVERY 30'-0" OF VIEWING DISTANCE PROVIDED THE HEIGHT IS 8 INCHES MINIMUM. VIEWING DISTANCE SHALL BE MEASURED AS THE HORIZONTAL DISTANCE BETWEEN THE CHARACTER AND WHERE SOMEONE IS EXPECTED TO VIEW THE SIGN.
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14. FOR VISUAL CHARACTERS, SPACING BETWEEN THE BASELINES OF SEPARATE LINES OF CHARACTERS WITHIN A MESSAGE SHALL BE 135% MINIMUM AND 170% MAXIMUM OF THE CHARACTER HEIGHT.
15. VISUAL CHARACTERS SHALL BE 40" MINIMUM ABOVE THE FLOOR OF THE VIEWING POSITION MEASURED TO THE BASELINE OF THE CHARACTER.
16. VISUAL CHARACTERS AND THEIR BACKGROUND SHALL HAVE A NON-GLARE FINISH. CHARACTERS SHALL CONTRAST WITH THEIR BACKGROUND, WITH EITHER LIGHT CHARACTERS ON A DARK BACKGROUND, OR DARK CHARACTERS ON A LIGHT BACKGROUND.
17. FOR RAISED CHARACTERS THE UPPERCASE LETTER I SHALL BE USED TO DETERMINE THE ALLOWABLE HEIGHT OF ALL CHARACTERS OF A FONT. THE HEIGHT OF THE UPPERCASE LETTER 'I' OF THE FONT, MEASURED VERTICALLY FROM THE BASELINE OF THE CHARACTER SHALL BE 5/8" MINIMUM AND 2" MAXIMUM.
18. FOR RAISED CHARACTERS THE UPPERCASE LETTER 'O' SHALL BE USED TO DETERMINE THE ALLOWABLE WIDTH OF ALL CHARACTERS IN A FONT. THE WIDTH OF THE UPPERCASE LETTER 'O' OF THE FONT SHALL BE 55% MINIMUM AND 110% MAXIMUM OF THE HEIGHT OF THE UPPERCASE 'I' IN THE FONT.
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20. CHARACTER SPACING SHALL BE MEASURED BETWEEN THE TWO CLOSEST POINTS OF ADJACENT RAISED CHARACTERS WITHIN A MESSAGE, EXCLUDING WORD SPACES. SPACING BETWEEN INDIVIDUAL RAISED CHARACTERS SHALL BE 1/8" MINIMUM MEASURED AT THE TOP SURFACE OF THE CHARACTERS, 1/16" MINIMUM MEASURED AT THE BASE OF THE CHARACTER, AND FOUR TIMES THE RAISED CHARACTER STROKE WIDTH MAXIMUM. CHARACTERS SHALL BE SEPARATED FROM RAISED BORDERS AND DECORATIVE ELEMENTS 3/8" MINIMUM.
21. SPACING BETWEEN THE BASELINES OF SEPARATE LINES OF RAISED CHARACTERS WITHIN A MESSAGE SHALL BE 135% MINIMUM AND 170% PERCENT MAXIMUM OF THE RAISED CHARACTER HEIGHT.
22. RAISED CHARACTERS/BRAILLE SHALL BE 48" MINIMUM ABOVE THE FLOOR, MEASURED TO THE BASELINE OF THE LOWEST RAISED CHARACTER/BRAILLE AND 60" MAXIMUM ABOVE THE FLOOR MEASURED TO THE BASELINE OF THE HIGHEST RAISED CHARACTER.
23. WHERE A SIGN CONTAINING RAISED CHARACTERS AND BRAILLE IS PROVIDED AT A DOOR, THE SIGN SHALL BE ALONGSIDE THE DOOR AT THE LATCH SIDE. WHERE A SIGN CONTAINING RAISED CHARACTERS AND BRAILLE IS PROVIDED AT DOUBLE DOORS WITH ONE ACTIVE LEAF, THE SIGN SHALL BE LOCATED ON THE INACTIVE LEAF. WHERE A SIGN CONTAINING RAISED CHARACTERS AND BRAILLE IS PROVIDED AT DOUBLE DOORS WITH TWO ACTIVE LEAVES, THE SIGN SHALL BE TO THE RIGHT OF THE RIGHT-HAND DOOR. WHERE THERE NO WALL SPACE ON THE LATCH SIDE OF A SINGLE DOOR, OR TO THE RIGHT SIDE OF DOUBLE DOORS, SIGNS SHALL BE ON THE NEAREST ADJACENT WALL. SIGNS CONTAINING RAISED CHARACTERS AND BRAILLE SHALL BE LOCATED SO THAT A CLEAR FLOOR AREA 18"X18" MINIMUM, CENTERED ON THE RAISED CHARACTERS IS PROVIDED BEYOND THE ARC OF ANY DOOR SWING BETWEEN THE CLOSED POSITION AND 45 DEGREE POSITION.
24. CHARACTERS AND THEIR BACKGROUND SHALL HAVE A NON-GLARE FINISH. CHARACTERS SHALL CONTRAST WITH THEIR BACKGROUND WITH EITHER LIGHT CHARACTERS ON A DARK BACKGROUND, OR DARK CHARACTERS ON A LIGHT BACKGROUND.
25. BRAILLE SHALL BE CONTRACTED (GRADE II) BRAILLE.
26. FOR BRAILLE THE INDICATION OF AN UPPERCASE LETTER OR LETTERS SHALL ONLY BE USED BEFORE THE FIRST WORD OF SENTENCES, PROPER NOUNS AND NAMES, INDIVIDUAL LETTERS OF THE ALPHABET, INITIALS OR ACRONYMS.
27. BRAILLE DOTS SHALL HAVE A DOMED OR ROUNDED SHAPE.
28. BRAILLE SHALL BE BELOW THE CORRESPONDING TEXT. IF TEXT IS MULTI LINED, BRAILLE SHALL BE PLACED BELOW ENTIRE TEXT. BRAILLE SHALL BE SEPARATED 3/8" MINIMUM FROM ANY OTHER RAISED CHARACTERS AND 3/8" MINIMUM FROM RAISED BORDERS AND DECORATIVE ELEMENTS. BRAILLE PROVIDED ON ELEVATOR CAR CONTROLS SHALL BE SEPARATED 3/16" MINIMUM EITHER DIRECTLY BELOW OR ADJACENT TO THE CORRESPONDING RAISED CHARACTERS OR SYMBOLS.
29. PICTOGRAMS SHALL HAVE A FIELD 6" MINIMUM IN HEIGHT. CHARACTERS OR BRAILLE SHALL NOT BE LOCATED IN THE PICTOGRAM FIELD.
30. PICTOGRAMS AND THEIR FIELDS SHALL HAVE A NON-GLARE FINISH. PICTOGRAMS SHALL CONTRAST WITH THEIR FIELDS, WITH EITHER A LIGHT PICTOGRAM ON A DARK FIELD OR A DARK PICTOGRAM ON A LIGHT FIELD.

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LICENSED ARCHITECT
JENNIFER BURKE JACKSON
7366
11/18 | 04 2021
STATE OF NORTH DAKOTA

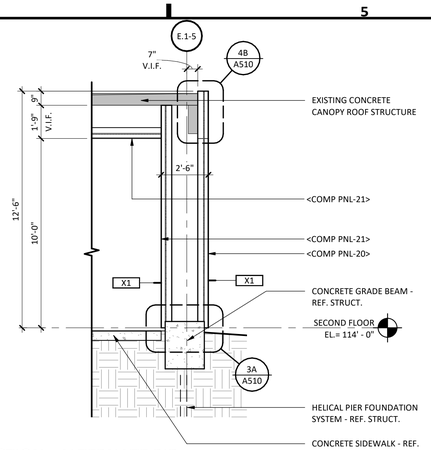
REVISION SCHEDULE

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	11/12/21
2	ADDENDUM 2	11/18/21

CITY OF MINOT
CITY HALL REHABILITATION
MINOT, ND

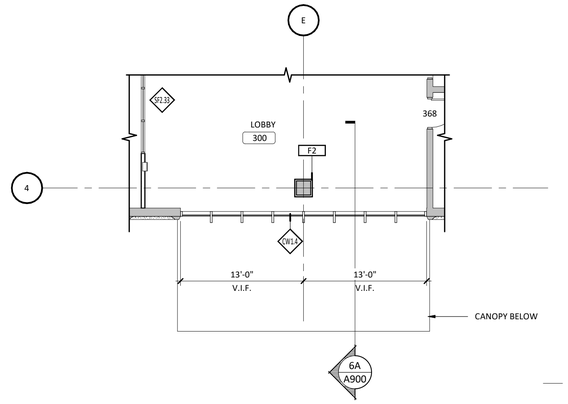
CITY PROJECT 4466
DATE
11/04/21
PHASE
CONSTRUCTION DOCUMENTS
PROJECT
21019
SHEET
A825
SIGNAGE DETAILS

11/18/2021 9:16:12 PM



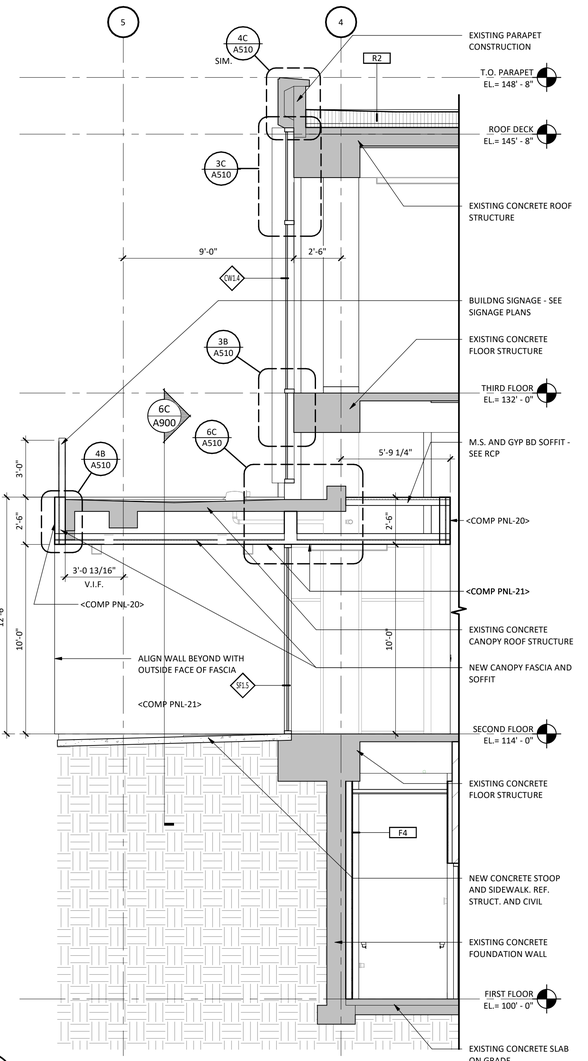
6C A900 CANOPY SIDE SECTION - ALTERNATE BID

SCALE: 1/4" = 1'-0"



4C A900 ALTERNATE 4 - THIRD FLOOR PLAN

SCALE: 1/8" = 1'-0"



6A A900 CANOPY SECTION - ALTERNATE BID

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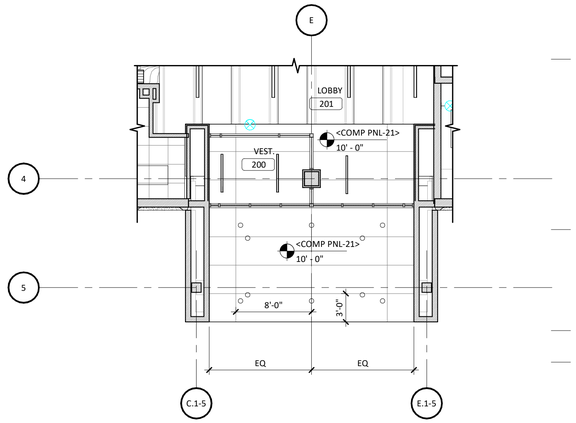
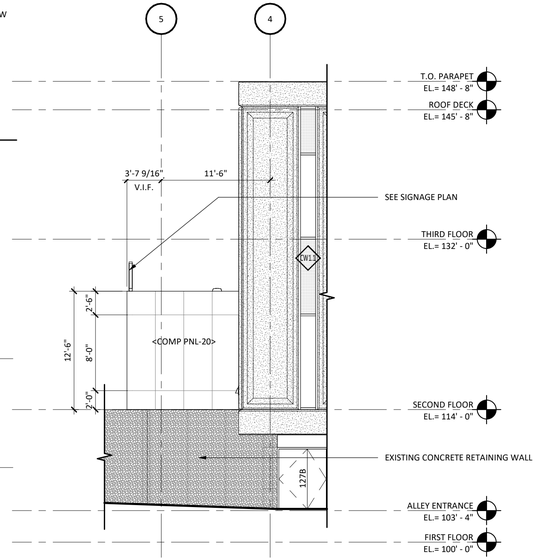


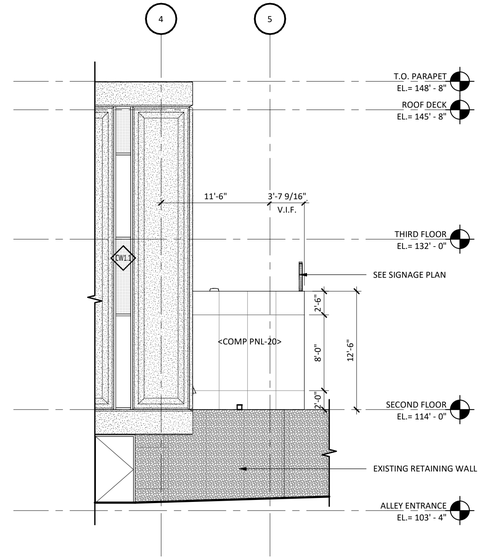
5B A900 ALTERNATE 3 - RCP

SCALE: 1/8" = 1'-0"



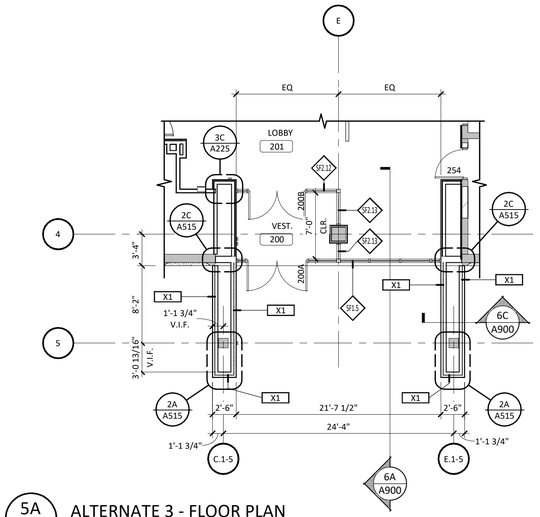
3B A900 ALTERNATE 3 - EAST ELEVATION

SCALE: 1/8" = 1'-0"



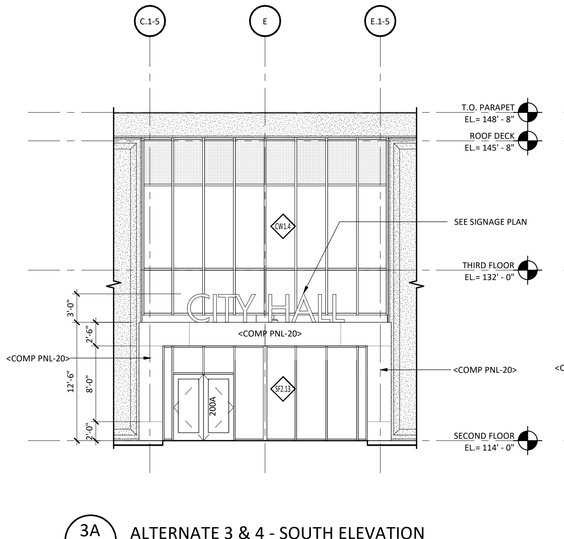
1B A900 ALTERNATE 3 - WEST ELEVATION

SCALE: 1/8" = 1'-0"



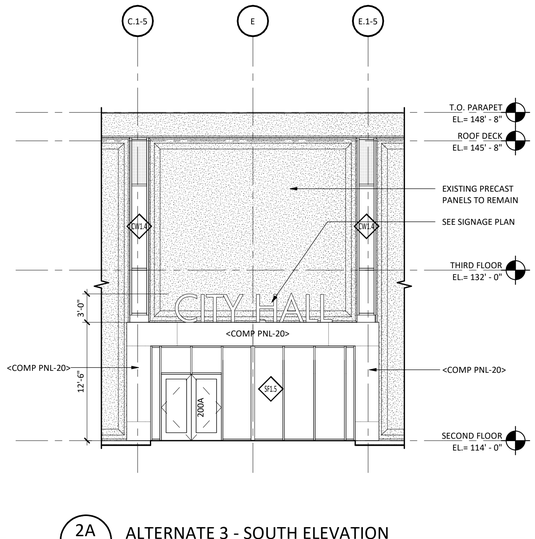
5A A900 ALTERNATE 3 - FLOOR PLAN

SCALE: 1/8" = 1'-0"



3A A900 ALTERNATE 3 & 4 - SOUTH ELEVATION

SCALE: 1/8" = 1'-0"



2A A900 ALTERNATE 3 - SOUTH ELEVATION

SCALE: 1/8" = 1'-0"

SHEET MATERIAL ID LIST

MATERIAL ID	SPEC SECTION & DESCRIPTION
COMP PNL-20	07 4243 - PHENOLIC RESIN COMPOSITE WALL PANELS
COMP PNL-21	07 4243 - PHENOLIC RESIN COMPOSITE WALL PANELS

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21019

SHEET
A900
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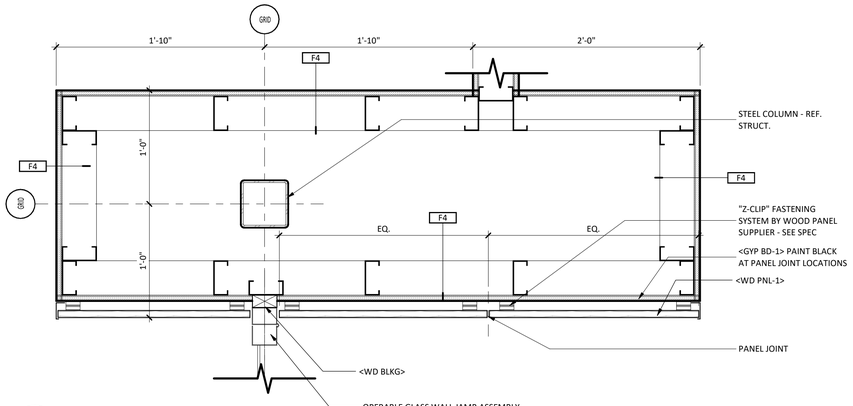
GLAZING ELEVATION GENERAL NOTES

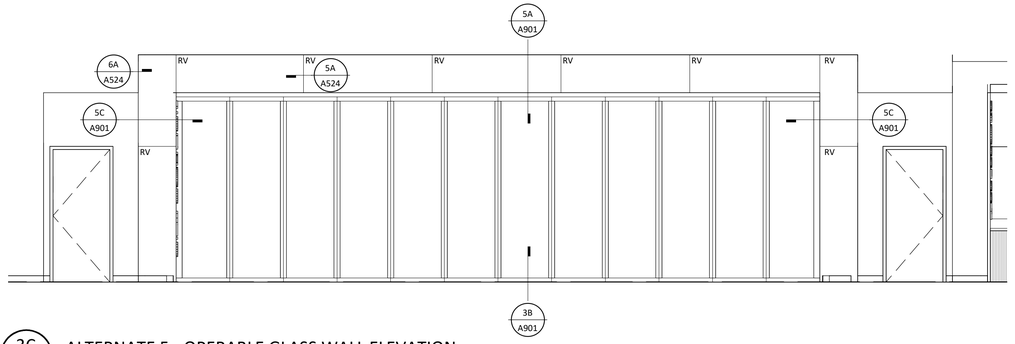
A. PROVIDE <INSUL TEMP GL-1> AT ALL EXTERIOR STOREFRONT AND CURTAINWALL UNLESS NOTED OTHERWISE
B. PROVIDE <TEMP GL-1> AT ALL INTERIOR STOREFRONT UNLESS NOTED OTHERWISE
C. FIELD VERIFY ALL EXISTING OPENINGS
D. ALL EXTERIOR CURTAINWALL AND STOREFRONT IS TO BE PROVIDED AS PART OF ALTERNATE 2. BASE BID: ALL EXTERIOR CURTAINWALL AND STOREFRONT IS TO REMAIN.
E. ALL STOREFRONT AND CURTAINWALL FRAMING IS TO BE ANODIZED FINISH UNLESS NOTED OTHERWISE. SEE SPEC FOR MORE INFORMATION.

SHEET MATERIAL ID LIST

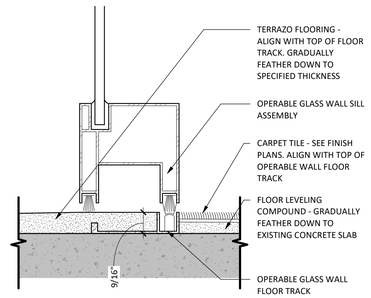
MATERIAL ID	SPEC SECTION & DESCRIPTION
ALCRTIN-1	08 4413 - GLAZED ALUMINUM CURTAIN WALLS
ALSTOR-1	08 4313 - ALUMINUM-FRAMED STOREFRONTS
INSUL GL-40	08 8000 - INSULATED SPANDREL GLAZING
INSUL TEMP GL-1	08 8000 - TEMPERED CLEAR INSULATED GLAZING
WD BLKG	06 1000 - WOOD BLOCKING
WD PNL-1	09 5100 - WOOD WALL PANEL



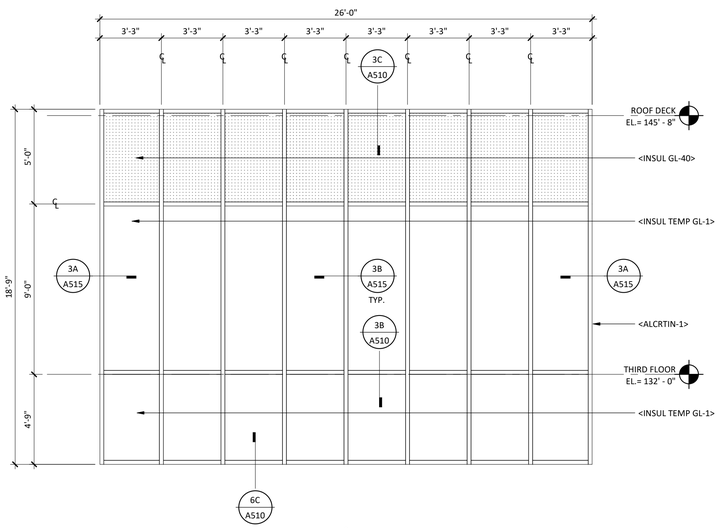
5C A901 OPERABLE GLASS WALL JAMB
SCALE: 1 1/2" = 1'-0"

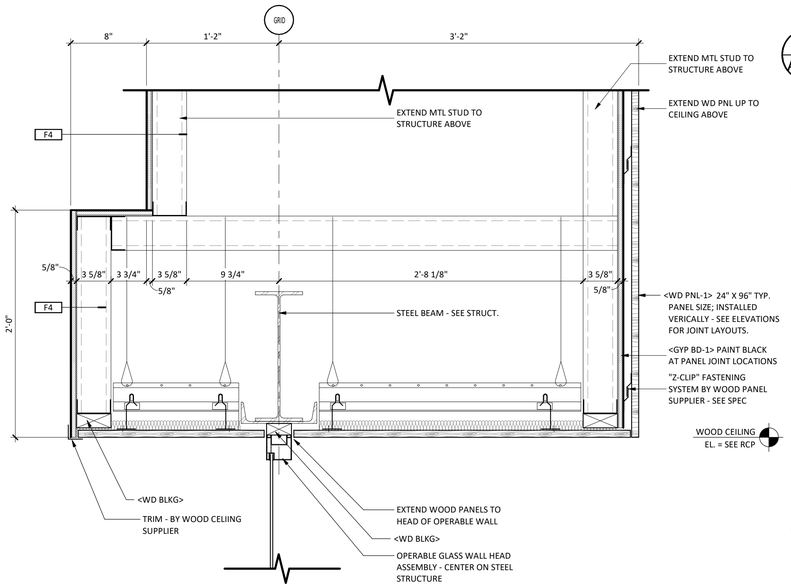


3C A901 ALTERNATE 5 - OPERABLE GLASS WALL ELEVATION
SCALE: 1/4" = 1'-0"

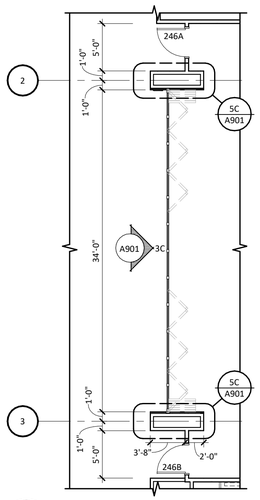


3B A901 OPERABLE GLASS WALL SILL
SCALE: 6" = 1'-0"

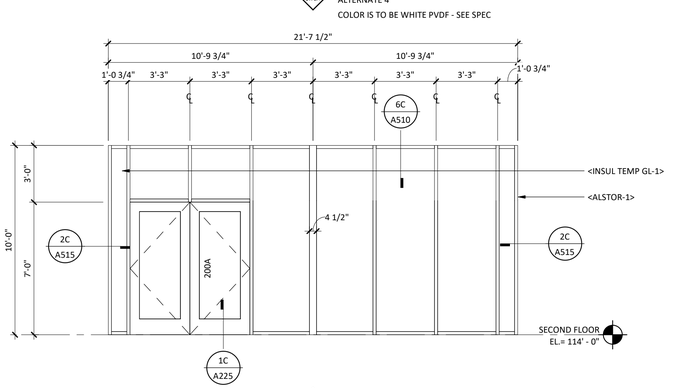




5A A901 OPERABLE GLASS WALL HEAD
SCALE: 1 1/2" = 1'-0"



3A A901 ALTERNATE 5 - FLOOR PLAN
SCALE: 1/8" = 1'-0"



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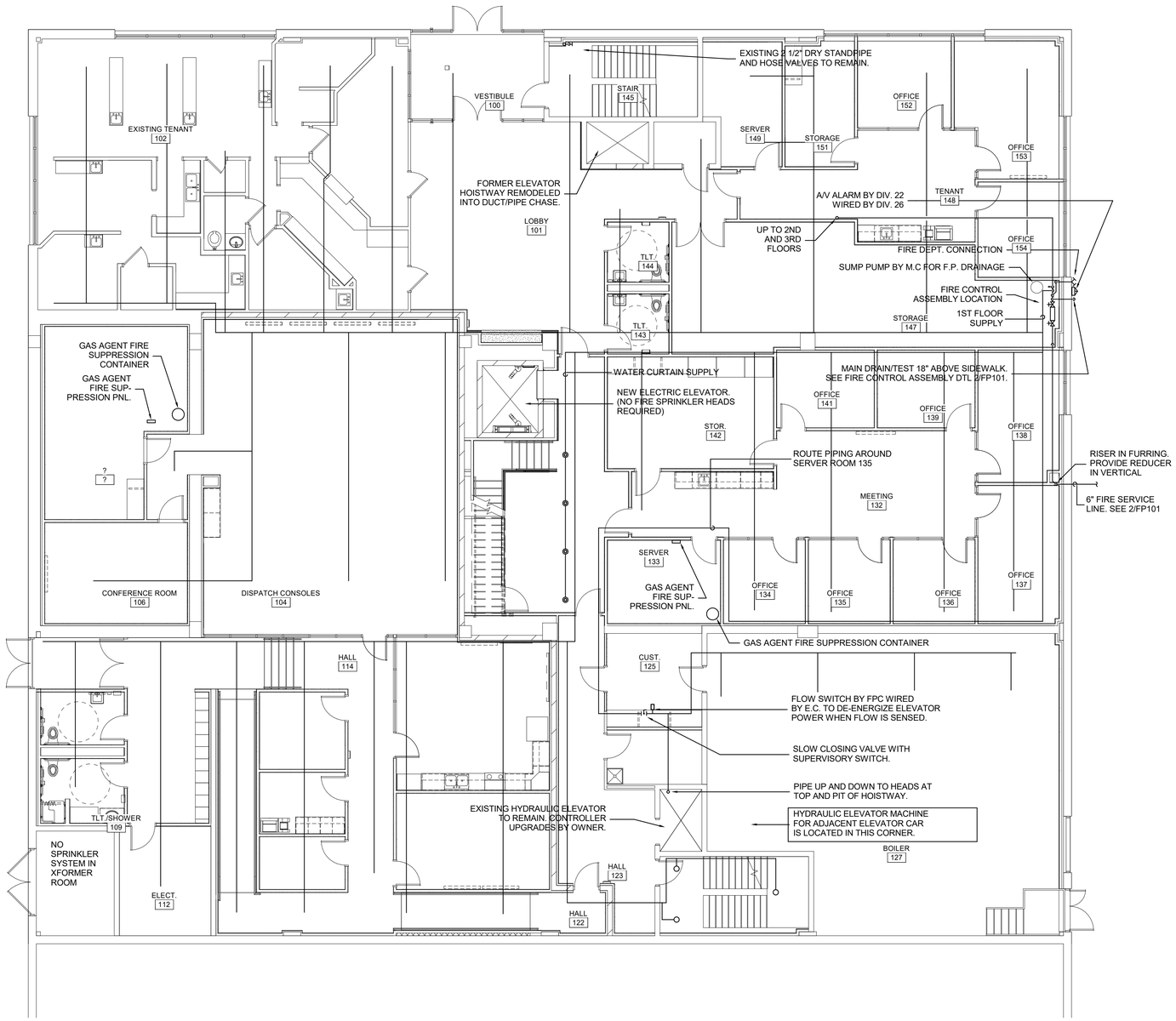

1 FP101

FIRST FLOOR FIRE SUPPRESSION

1/8" = 1'-0"

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FP101
1ST FLOOR FIRE SUPPRESSION

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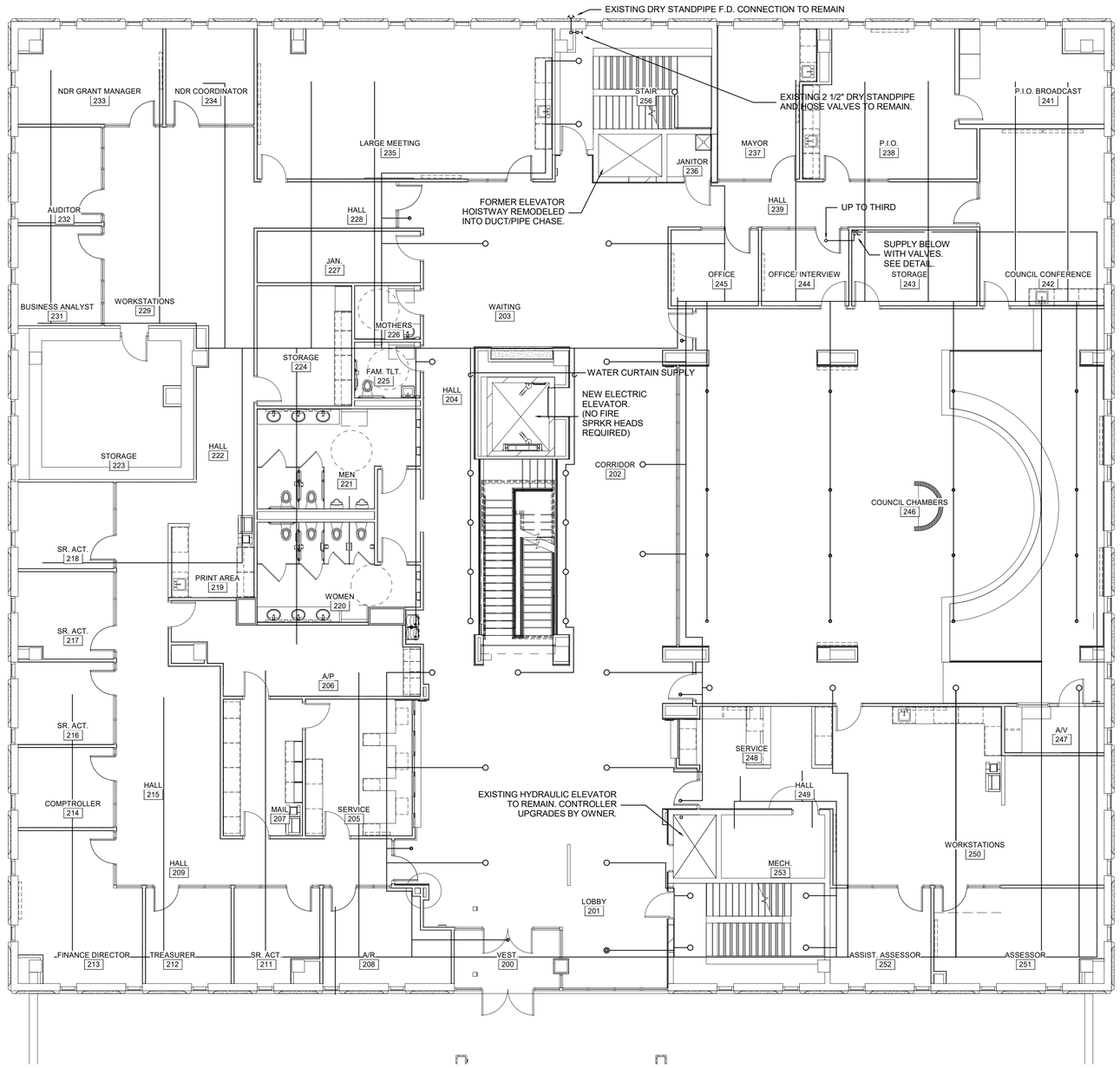

1 FP102 SECOND FLOOR FIRE SUPPRESSION

1/8" = 1'-0"

FIRE PROTECTION GENERAL NOTES

1. THE BUILDING FLOORS AND ROOF STRUCTURE ARE CONCRETE BEAM, JOIST AND PAN.
2. PAINTING OF EXPOSED PIPING WILL BE BY OTHERS.
3. THE PIPING ROUTES ARE SHOWN TO INDICATE THE DESIGN TEAM'S PREFERENCE AND COORDINATION. WHERE PIPE IS SUSPENDED FROM EXPOSED STRUCTURE IN PUBLIC AREAS SUSPEND PIPING FROM JOIST.
4. ALL SPRINKLER HEAD LOCATIONS ARE NOT INDICATED AND HAVE BEEN DEFERRED TO THE SYSTEM DESIGNER. HEADS SHOWN ARE INDICATE DESIGN TEAM'S PREFERENCE AND COORDINATION. PIPING ROUTES IN LOBBY 201 AND 300 ARE OF PARTICULAR IMPORTANCE TO THE APPEARANCE OF THE SPACES.
5. RADIO ROOM 103 AND SERVER 135 SHALL BE PROTECTED BY A CLEAN GAS AGENT.
6. PROVIDE OFFSETS AS REQUIRED FOR DUCTS, PIPING. STRUCTURE AND ARCHITECTURAL ELEMENTS. PROVIDE DRAIN PLUGS FOR LOW VOLUME TRAPS AND VALVES WITH HOSE CONNECTIONS FOR LARGE VOLUMES OF TRAPPED WATER.
7. THREE STORY OPENING CONTAINING NEW EXIT ACCESS STAIR COMPLYING WITH IBC 1019.3, ITEM 4: EXIT ACCESS STAIRWAYS AND RAMPS IN BUILDING EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, WHERE THE AREA OF THE VERTICAL OPENING BETWEEN STORIES DOES NOT EXCEED TWICE THE HORIZONTAL PROJECTED ARE OF THE STAIRWAY OR RAMP AND THE OPENING IS PROTECTED BY A DRAFT CURTAIN AND CLOSELY SPACED SPRINKLERS IN ACCORDANCE WITH NFPA 13. IN OTHER THAT GROUP B AND M OCCUPANCIES, THIS PROVISION IS LIMITED TO OPENINGS THAT DO NOT CONNECT MORE THAN FOUR STORIES.

FIRE SPRINKLER HEAD DESCRIPTIONS

1. REFER TO REFLECTIVE CEILING PLANS INCLUDED IN ARCHITECTURAL PLANS FOR CEILING TYPES.
2. SPRINKLER HEADS IN ROOMS WITH ACOUSTICAL TILE AND GYPSUM BOARD CEILINGS SHALL BE CONCEALED PENDANTS WITH WHITE COVER PLATES.
3. SPRINKLER HEADS IN COUNCIL CHAMBERS 246 WITH WOOD CEILING SHALL BE CONCEALED PENDANTS WITH BLACK COVER PLATES.
4. SPRINKLER HEADS IN ALL PUBLIC SPACES INCLUDING STAIRS WITH EXPOSED PIPING SUSPENDED FROM EXPOSED STRUCTURE SHALL BE WHITE. PIPING WILL BE PAINTED BY OTHERS. HEADS IN MECHANICAL AND STORAGE ROOMS MAY HAVE ROUGH BRASS HEADS ON UNPAINTED EXPOSED PIPE
5. PROVIDE WATER CURTAIN ALONG DRAFT CURTAIN AT EACH LEVEL FLOOR OPENING.HEAD FLOWS TO MEET NFPA 13.
6. SPRINKLER HEADS PROTECTING THE AREA UNDER THE SKYLIGHT SHALL HAVE HIGH TEMPERATURE CLASSIFICATION.

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2ND FLOOR FIRE SUPPRESSION

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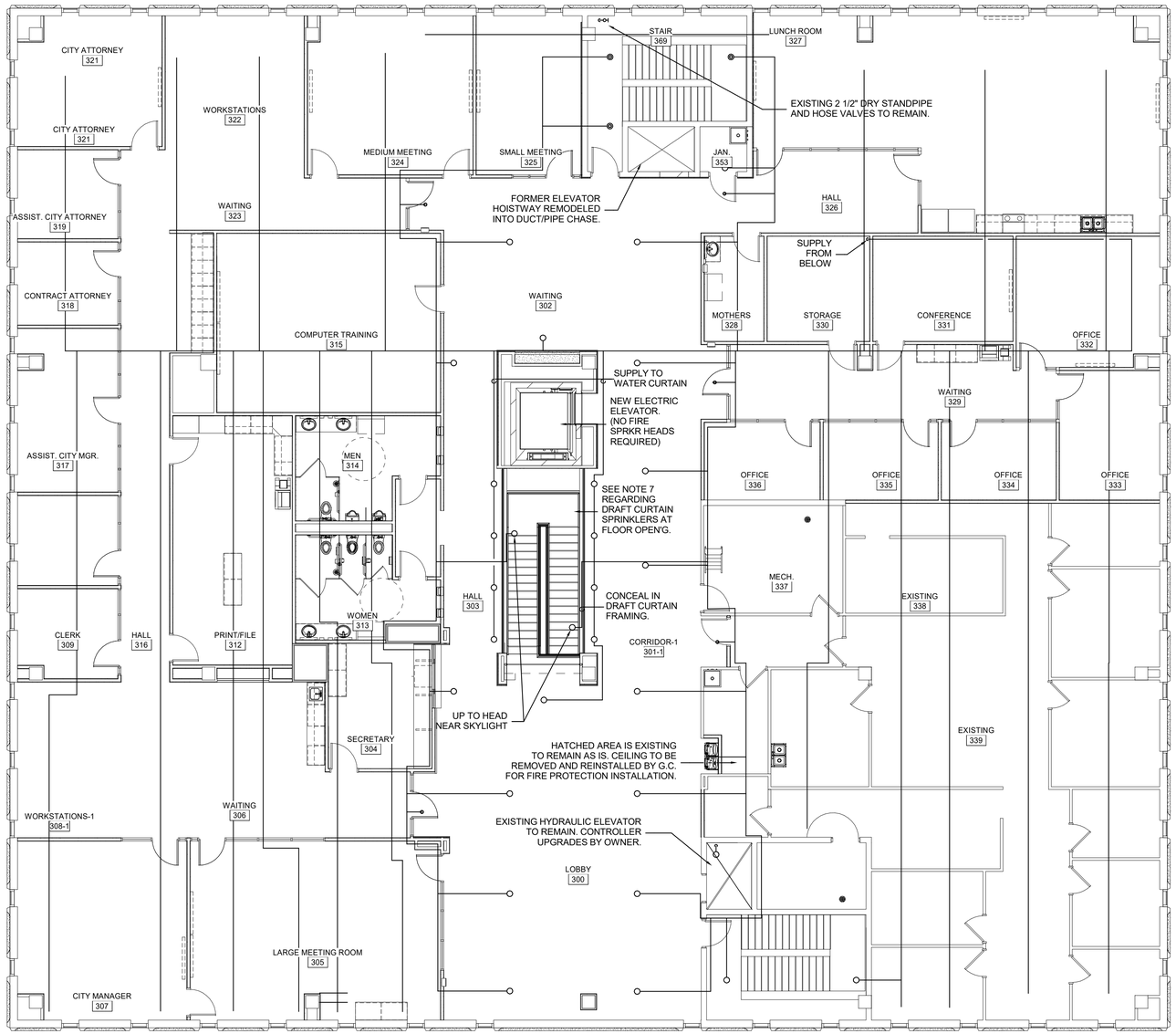
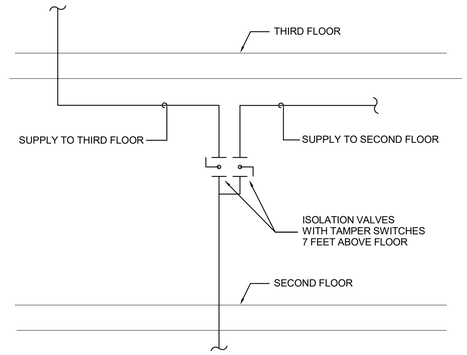
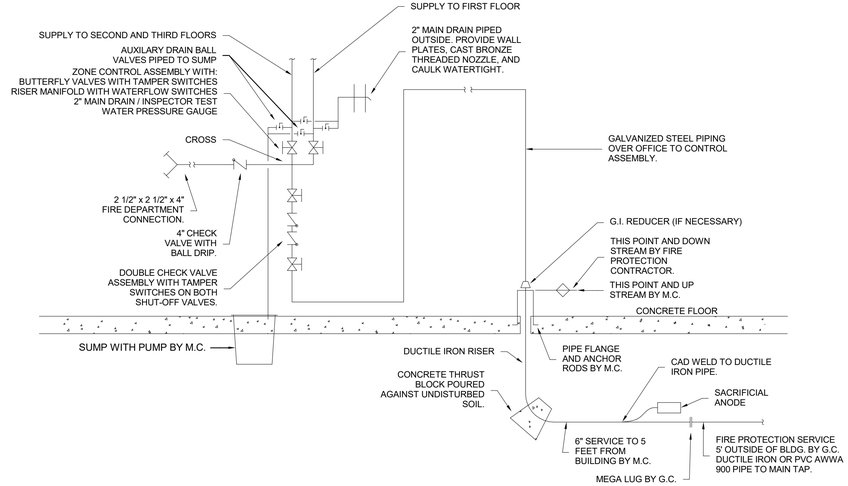


1 FP103 THIRD FLOOR FIRE SUPPRESSION
1/8" = 1'-0"



2 FP103 ISOLATION VALVES DETAIL
NTS



3 FP103 FIRE RISER DETAIL
1/8" = 1'-0"

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FP103
3RD FLOOR FIRE SUPPRESSION

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GENERAL NOTES - FIRE PROTECTION

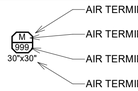
A	UNDER THE SCOPE OF THIS PROJECT THE DIVISION 21 CONTRACTOR SHALL EXTEND THE EXISTING FIRE SPRINKLER SYSTEM AS REQUIRED IN ORDER TO ENSURE THE COMPLETED PROJECT AHERES TO NFPA 13
B	DIVISION 21 CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR AND OTHER TRADES ALL ASSOCIATED PIPING AND EQUIPMENT LOCATIONS TO AVOID INTERFERENCES.
C	DIVISION 21 CONTRACTOR SHALL REMOVE AND RELOCATE ALL PIPING AND EQUIPMENT WHICH INTERFERES WITH THE WORK OF OTHER TRADES AT THIS CONTRACTOR'S SOLE EXPENSE IF THIS CONTRACTOR'S WORK IS NOT COORDINATED PRIOR TO THE BEGINNING OF THE WORK.
D	SPRINKLER CONTROL VALVES SHALL BE PROVIDED WITH VALVE SUPERVISORY SWITCHES.
E	ELECTRICAL DEVICES FOR THE FIRE PROTECTION SYSTEM SHALL BE COMPATIBLE WITH THE FIRE ALARM SYSTEM.
F	PIPING SHALL BE INSTALLED SO THAT ALL PORTIONS OF THE SYSTEM CAN BE DRAINED BACK THROUGH THE DRAIN VALVES IN ACCORDANCE WITH NFPA 13.
G	DESIGN ALL STORAGE ROOM FOR ORDINARY HAZARD.
H	OBTAIN SIGNED CERTIFIED TEST RESULTS FOR RECORD OF ALL ACCEPTANCE TESTS AS REQUIRED BY NFPA 13 FOR THE INSTALLED SPRINKLER SYSTEM. THE TEST RESULTS SHALL BE REPORTED UTILIZING NFPA STANDARD FORMS.
I	REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS, CEILING HEIGHTS, LOCATION OF PARTITIONS, ETC.
J	PROVIDE SPRINKLERS IN EACH AREA OF THE SAME TYPE AND DEPTH.
K	INSTALL SPRINKLERS IN ROWS PERPENDICULAR AND/OR PARALLEL TO OTHER ELEMENTS SUCH AS LIGHTS, SOFFITS, CEILING TILE, WALL, ETC. UNLESS NOTED OTHERWISE.
L	SPRINKLER LOCATIONS IN EACH SPACE SHALL BE SYMMETRICAL IN SPACE AND SYMMETRICALLY LOCATED RELATIVE TO LIGHTS, DIFFUSERS, ETC. WHERE POSSIBLE ALL SPRINKLER HEADS SHALL BE LOCATED IN THE CENTER OF 2x2 CEILING TILES.
M	USE SPRINKLER HEADS WITH GASKETED SEAL AS SPECIFIED IN ALL AREAS OF HOSPITAL CLEAN ROOM WHERE GASKETED CEILING TILE IS USED. REFER TO THE SPECIFICATION.
N	SEE RESPECTIVE MECHANICAL FLOOR PLANS FOR COORDINATION AND LOCATION OF SYSTEM COMPONENTS.
O	USE UPRIGHT HEADS IN ROOMS WITH UNFINISHED CEILINGS.
P	USE INSTITUTIONAL/PENAL SPRINKLER HEADS AS SPECIFIED IN ALL ROOMS THAT ARE CONSIDERED TO BE DETANTION GRADE. REFER TO THE ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
Q	ROUTE ALL PIPING PARALLEL TO BUILDING LINES.
R	PROVIDE PIPE ESCUTCHEONS AROUND ALL PIPING PASSING THROUGH EXPOSED WALLS. ESCUTCHEONS TO BE THE SAME COLOR AS THE PIPE OR SURROUNDING WALL SURFACE.
S	SPRINKLER HEADS AND PIPING TO BE LOCATED SO THEY DO NOT PASS OVER SWITCHGEAR AND PANELBOARDS.
T	THE DIVISION 21 CONTRACTOR SHALL ENSURE FIRE PROTECTION IS MAINTAINED IN OCCUPIED AREAS ACCORDING TO THE PHASING PLAN SHOWN ON THE ARCHITECTURAL DRAWINGS DURING THE COURSE OF CONSTRUCTION.

GENERAL NOTES

A	PERFORM WORK IN ACCORDANCE WITH THE LATEST EDITIONS, REVISIONS, AMENDMENTS OR SUPPLEMENTS OF APPLICABLE STATUES, ORDINANCES, CODES OR REGULATIONS OF FEDERAL, STATE, AND LOCAL AUTHORITIES HAVING JURISDICTION IN EFFECT ON THE DATE THE DRAWING PACKAGE IS ISSUED.
B	ARRANGE WITH AUTHORITIES AND UTILITY COMPANIES FOR PERMITS, FEES AND SERVICE CONNECTIONS. VERIFY LOCATIONS AND ARRANGEMENTS AND PAY ALL CHARGES, INCLUDING INSPECTIONS.
C	THIS CONTRACTOR SHALL COORDINATE HIS WORK WITH THE OTHER CONTRACTORS ON THE PROJECT AND INSTALL MECHANICAL SYSTEMS IN A MANNER WHICH WILL CONFORM TO STRUCTURE, KEEP PASSAGEWAYS AND OPENINGS CLEAR, PRESERVE HEAD ROOM, CLEAR LIGHT FIXTURES AND NOT COVER UP JUNCTION BOXES.
D	INSTALL PIPING AND DUCTWORK TO PROVIDE THE MAXIMUM CLEAR HEIGHT UNDERNEATH UNLESS OTHERWISE NOTED.
E	THE ENTIRE SYSTEM AND ITS COMPONENT ITEMS SHALL OPERATE WITHOUT OBJECTIONABLE NOISE AND VIBRATION.
F	REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS OF FLOOR DRAINS, CEILING DIFFUSERS, GRILLES AND REGISTERS.
G	THIS CONTRACTOR SHALL FIELD VERIFY LOCATIONS FOR ALL DUCTWORK AND PIPING FOR THE INSTALLATION PRIOR TO FABRICATION.
H	THIS CONTRACTOR SHALL MAKE OFFSETS IN PIPING OR DUCTWORK TO AVOID INTERFERENCE WITH OTHER TRADES, AT NO ADDITIONAL COST TO THE OWNER, WHEN SO DIRECTED BY THE ARCHITECT/ENGINEER.
I	DUCT DIMENSIONS SHOWN ARE AIR STREAM SIZES (FREE AREA). SIZES DO NOT INCLUDE ALLOWANCE FOR DUCT INSULATION OR LINER.
J	PIPE ROUTING IS SHOWN WITH AN EXAGGERATED SPACING FOR CLARITY. ACTUAL PLACEMENT OF PIPING SHOULD BE DONE COLLECTIVELY AND IN SUCH A MANNER AS NOT TO CONFLICT WITH LOCATION SENSITIVE COMPONENTS SUCH AS LIGHT FIXTURES.
K	PROVIDE FIRE-STOP AROUND PIPE AND/OR DUCT PENETRATIONS THROUGH FIRE RATED FLOORS AND WALLS.
L	FLEXIBLE RUNOUTS TO CEILING DIFFUSERS SHALL BE SAME SIZE AS DIFFUSER NECK SIZE UNLESS OTHERWISE NOTED. MAXIMUM FLEX LENGTH SHALL BE 10'; PROVIDE HARD DUCT AS REQUIRED.
M	COORDINATE ALL SLAB PENETRATIONS AND SLEEVES PRIOR TO EACH CONCRETE POUR. PROVIDE SLEEVES AND INSERTS AS REQUIRED FOR PLACEMENT IN STRUCTURAL OR ARCHITECTURAL WORK.
N	EXTEND CLEANOUTS TO FINISHED FLOOR OR WALL SURFACE WITH ACCESS COVERS INSTALLED FLUSH TO FINISHED SURFACE. LUBRICATE THREADED CLEANOUT PLUGS WITH MIXTURE OF LINSEED OIL AND GRAPHITE. ENSURE CLEARANCE AT CLEANOUT FOR RODDING OF DRAINAGE SYSTEM.
O	PROVIDE NATURAL GAS TAKE-OFFS FROM TOP OF MAIN LINES FOR DROPS TO EQUIPMENT LOCATIONS. PROVIDE 6" DIRT LEG FITTINGS AT NATURAL GAS PIPE EQUIPMENT CONNECTIONS.
P	PLUMBING EQUIPMENT SHALL BE PROVIDED WITH SHUT-OFF VALVES AND UNIONS TO FACILITATE SERVICING.
Q	PROVIDE SHOCK ARRESTORS ON ALL DOMESTIC COLD AND HOT WATER PIPING SERVING QUICK ACTING VALVES SUCH AS FLUSH VALVES AND AUTOMATIC SENSOR FAUCETS.
R	INSTALL ALL SUPPLY, RETURN, AND EXHAUST AIR GRILLS/DIFFUSERS A MINIMUM OF 3' FROM ALL SMOKE/HEAT DETECTION DEVICES

HVAC LEGEND

- POSITIVE PRESSURE DUCT
- NEGATIVE PRESSURE DUCT
- MANUAL DAMPER
- MOTORIZED DAMPER
- FIRE DAMPER
- COMB. SMOKE/FIRE DAMPER
- BACK DRAFT DAMPER
- ACCESS DOOR
- ELBOW WITH TURNING VANES
- HI-EFFICENCY TAKEOFF (W/ VOLUME DAMPER)
- FLEXIBLE DUCT



- AIR TERMINAL TAG
- AIR TERMINAL MARK
- AIR TERMINAL CFM
- AIR TERMINAL SIZE

SPRINKLER HEAD LEGEND

○	UPRIGHT HEAD
●	PENDENT HEAD
◉	CONCEALED PENDENT HEAD
◎	RECESSED HEAD
⊗	UPRIGHT HEAD W/ GUARD
✹	PENDENT HEAD W/ GUARD
◕	DRY PENDENT

PIPING VALVE & ACCESSORY LEGEND

	BALL VALVE
	BALL VALVE INDICATOR
	BUTTERFLY VALVE
	GATE VALVE
	VENTURI
	CHECK VALVE
	2-WAY HYDRONIC CONTROL VALVE
	2-WAY DOMESTIC CONTROL VALVE
	3-WAY CONTROL VALVE
	DRAIN VALVE
	STRAINER
	MANUAL AIR VENT
	AUTO AIR VENT
	TEMPERATURE GAUGE
	PRESSURE GAUGE
	SENSOR
	FLOW METER
	UNION

LINE TYPE LEGEND

- EXISTING
- NEW
- REMOVE
- HIDDEN
- MATCHLINE

PIPING LEGEND

——A——	ABOVEGROUND WASTE
——UGW——	UNDERGROUND WASTE
——V——	VENT
——RC——	RAIN CONDUCTOR
——CW——	DOMESTIC COLD WATER
——C——	DOMESTIC COLD WATER
——HW——	DOMESTIC HOT WATER
——H——	DOMESTIC HOT WATER
——RHW——	RECIRC HOT WATER
——R——	RECIRC HOT WATER
——140 HW——	HIGH TEMP HOT WATER
——ORC——	OVERFLOW RAIN CONDUCTOR
——HWS——	HOT WATER HTG SUPPLY
——HWR——	HOT WATER HTG RETURN
——HWR——	HOT WATER HTG RETURN
——HPS——	HEAT PUMP SUPPLY
——HPR——	HEAT PUMP RETURN
——HPR——	HEAT PUMP RETURN
——COND——	CONDENSATE DRAIN
——CTS——	CHILLED TOWER SUPPLY
——CTR——	CHILLED TOWER RETURN
——G——	NATURAL GAS

PROJECT DESIGN CONDITIONS
MINOT, NORTH DAKOTA

	SUMMER			WINTER
	DB	WB	DEW PT.	DB
OUTDOOR	89°F	67°F	N/A	-22°F
INDOOR	75°F	N/A	55°F	72°F

ND STATE BUILDING CODES

(IBC)	2018 INTERNATIONAL BUILDING CODE
(IRC)	2018 INTERNATIONAL RESIDENTIAL CODE
(IMC)	2018 INTERNATIONAL MECHANICAL CODE
(IFGC)	2018 INTERNATIONAL FUEL GAS CODE
(IECC)	2018 INTERNATIONAL ENERGY CONSERVATION CODE
(IEBC)	2018 INTERNATIONAL EXISTING BUILDING CODE
(UPC)	2018 NORTH DAKOTA PLUMBING CODE

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CITY OF MINOT
MINOT CITY HALL RENOVATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET M001
REFERENCE SHEET

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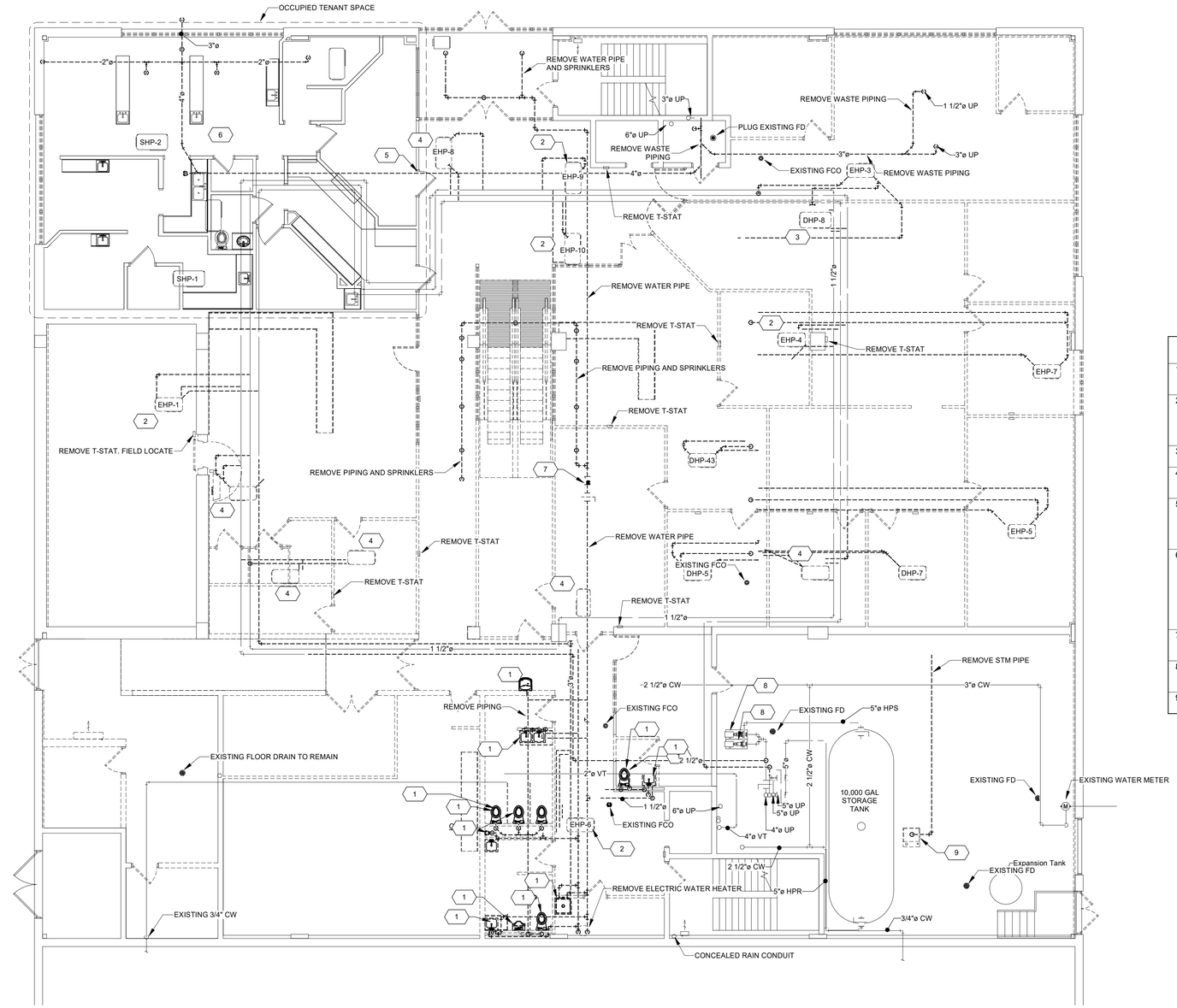

1 M101 FIRST FLOOR PLUMBING AND PIPING DEMOLITION PLAN

1/8" = 1'-0"

LINE TYPE LEGEND	
	EXISTING
	NEW
	REMOVE
	HIDDEN
	MATCHLINE

PIPING VALVE & ACCESSORY LEGEND	
	BALL VALVE
	BALL VALVE INDICATOR
	BUTTERFLY VALVE
	GATE VALVE
	VENTURI
	CHECK VALVE
	2-WAY HYDRONIC CONTROL VALVE
	2-WAY DOMESTIC CONTROL VALVE
	3-WAY CONTROL VALVE
	DRAIN VALVE
	STRAINER
	MANUAL AIR VENT
	AUTO AIR VENT
	TEMPERATURE GAUGE
	PRESSURE GAUGE
	SENSOR
	FLOW METER
	UNION

Keynote Legend	
1	REMOVE PLUMBING FIXTURE AND ATTACHED SUPPLY, VENT, AND WASTE PIPING AS SHOWN.
2	DISCONNECT HEAT PUMP AND STORE FOR REUSE AND RELOCATED. REMOVE PIPING, VALVES AS SHOWN. CAP PIPING AT MAIN PIPE WHERE MAIN PIPING IS TO REMAIN.
3	REMOVE HEAT PUMP AND DUCTWORK, PIPING, AND DIFFUSERS. AS SHOWN.
4	REMOVE HEAT PUMP AND PIPING, VALVES AS SHOWN. CAP PIPING AT MAIN PIPE WHERE MAIN PIPING IS TO REMAIN.
5	REMOVE WASTE PIPING UP TO TENANT SPACE. CUT AND ABANDON PIPING ABOVE TENANT SPACE. TENANT WILL CONTINUE TO OCCUPY SPACE THROUGH THE CONSTRUCTION PROCESS.
6	FIRST FLOOR TENANT POTABLE WATER IS EVIDENTLY SUPPLIED FROM TOILET ROOMS ON 2ND FLOOR. TENANT WILL REMAIN IN SPACE DURING CONSTRUCTION AND WILL NEED UNINTERRUPTED WATER SERVICE. PROVIDE TEMPORARY HOT AND COLD WATER PIPING AS REQUIRED.
7	REMOVE WATER PIPING, VALVES, AND SPRINKLER HEADS. PIPE SUPPORTS SPRINKLER SYSTEM FOR ESCALATOR
8	EXISTING TACO BASE MOUNTED PUMP. REPLACE THE 10 HP MOTOR WITH MOTOR SUITABLE FOR VFD CONTROL.
9	REMOVE ELECTRIC STEAM HUMIDIFIER AND ATTACHED PIPING AS SHOWN.

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SHEET
M101
1ST FLOOR PIPING DEMOLITION

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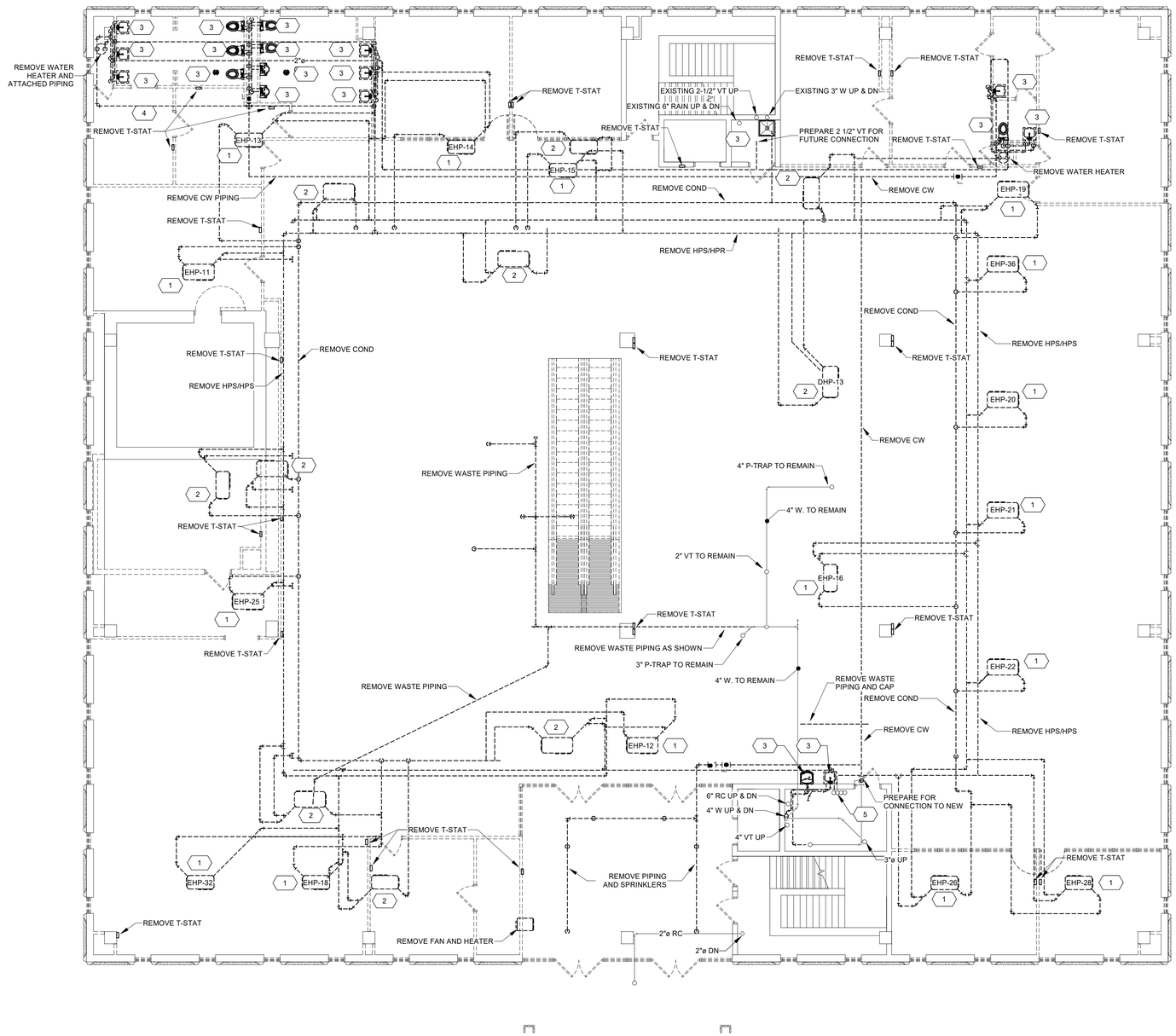

LINE TYPE LEGEND

———	EXISTING
———	NEW
- - - -	REMOVE
———	HIDDEN
——·——	MATCHLINE

PIPING VALVE & ACCESSORY LEGEND

	BALL VALVE
	BALL VALVE INDICATOR
	BUTTERFLY VALVE
	GATE VALVE
	VENTURI
	CHECK VALVE
	2-WAY HYDRONIC CONTROL VALVE
	2-WAY DOMESTIC CONTROL VALVE
	3-WAY CONTROL VALVE
	DRAIN VALVE
	STRAINER
	MANUAL AIR VENT
	AUTO AIR VENT
	TEMPERATURE GAUGE
	PRESSURE GAUGE
	SENSOR
	FLOW METER
	UNION

Keynote Legend

1	DISCONNECT HEAT PUMP AND STORE FOR REUSE AND RELOCATED. REMOVE PIPING, VALVES AS SHOWN. CAP PIPING AT MAIN PIPE WHERE MAIN PIPING IS TO REMAIN.
2	REMOVE HEAT PUMP AND PIPING, VALVES AS SHOWN. CAP PIPING AT MAIN PIPE WHERE MAIN PIPING IS TO REMAIN.
3	REMOVE PLUMBING FIXTURE AND ATTACHED SUPPLY, VENT, AND WASTE PIPING AS SHOWN.
4	FIRST FLOOR TENANT POTABLE WATER IS EVIDENTLY SUPPLIED FROM TOILET ROOMS ON 2ND FLOOR. TENANT WILL REMAIN IN SPACE DURING CONSTRUCTION AND WILL NEED UNINTERRUPTED WATER SERVICE. PROVIDE TEMPORARY HOT AND COLD WATER PIPING AS REQUIRED.
5	UNDER BASE BID RELOCATE COOLING TOWER TO LOCATION SHOWN ON DRAWINGS. UNDER ALTERNATE BID REMOVE COOLING TOWER.

1 M102

SECOND FLOOR PLUMBING AND PIPING DEMOLITION PLAN

1/8" = 1'-0"

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SHEET
M102
2ND FLOOR PIPING DEMOLITION

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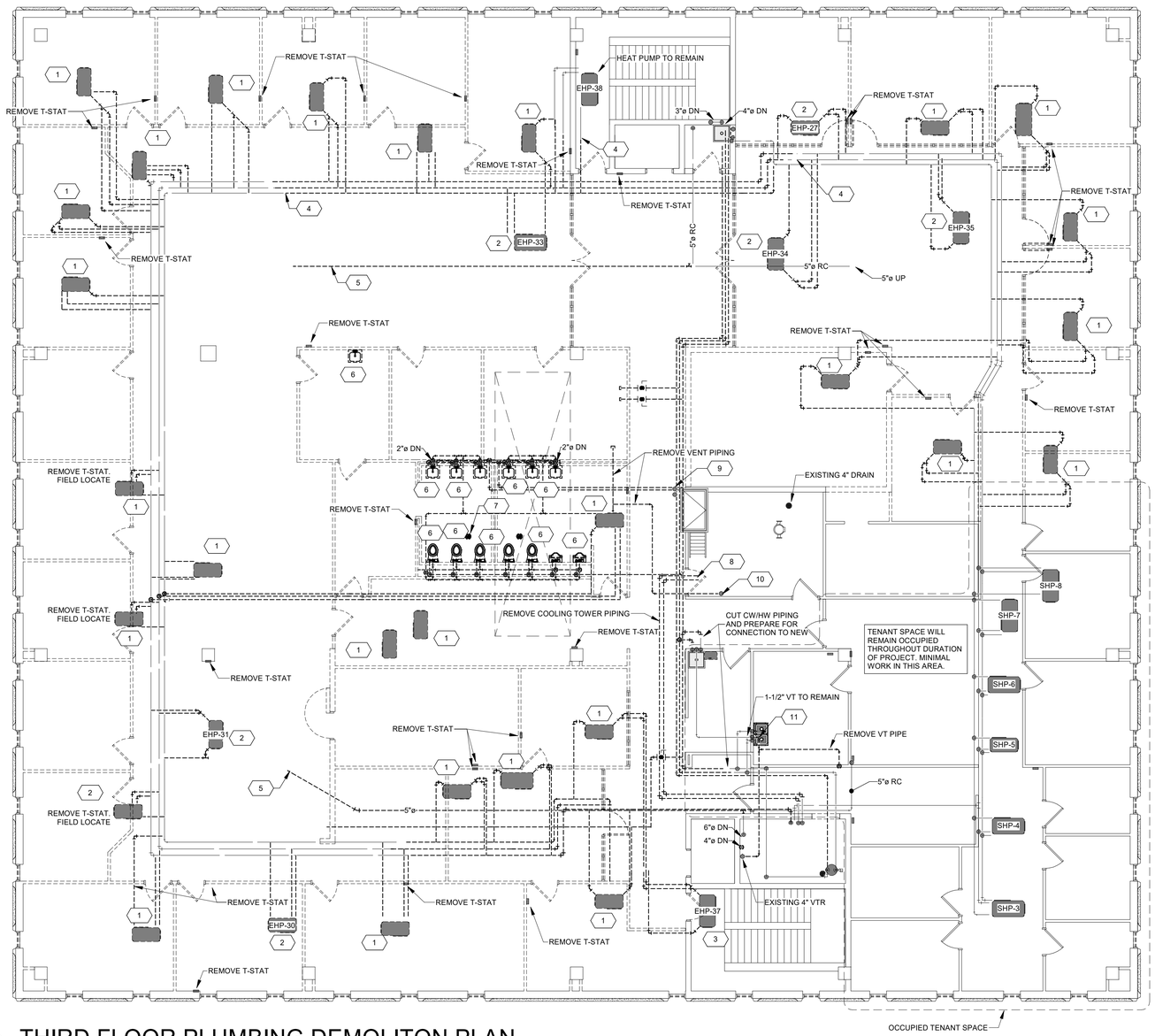

1 M103 THIRD FLOOR PLUMBING DEMOLITON PLAN

1/8" = 1'-0"

LINE TYPE LEGEND

	EXISTING
	NEW
	REMOVE
	HIDDEN
	MATCHLINE

PIPING VALVE & ACCESSORY LEGEND

	BALL VALVE
	BALL VALVE INDICATOR
	BUTTERFLY VALVE
	GATE VALVE
	VENTURI
	CHECK VALVE
	2-WAY HYDRONIC CONTROL VALVE
	2-WAY DOMESTIC CONTROL VALVE
	3-WAY CONTROL VALVE
	DRAIN VALVE
	STRAINER
	MANUAL AIR VENT
	AUTO AIR VENT
	TEMPERATURE GAUGE
	PRESSURE GAUGE
	SENSOR
	FLOW METER
	UNION

Keynote Legend

1	REMOVE HEAT PUMP AND PIPING, VALVES AS SHOWN. CAP PIPING AT MAIN PIPE WHERE MAIN PIPING IS TO REMAIN.
2	DISCONNECT HEAT PUMP AND STORE FOR REUSE AND RELOCATED. REMOVE PIPING, VALVES AS SHOWN. CAP PIPING AT MAIN PIPE WHERE MAIN PIPING IS TO REMAIN.
3	DISCONNECT AND REMOVE PIPING FROM HEAT PUMP. PREPARE HEAT PUMP FOR CONNECTION TO NEW PIPING AS REQUIRED.
4	CUT HPS, HPR, AND COND PIPING AND PREPARE FOR CONNECTION TO NEW PIPING.
5	REMOVE RAIN CONDUIT PIPING AS SHOWN. PREPARE ROOF DRAIN FOR CONNECTION TO NEW PIPING. CONTRACTORS OPTION TO RETAIN A SECTION OF PIPING FROM ROOF DRAIN TO PROVIDE CONNECTION TO NEW PIPING.
6	REMOVE PLUMBING FIXTURE AND ATTACHED SUPPLY, VENT, AND WASTE PIPING AS SHOWN.
7	REMOVE FLOOR DRAIN AND PATCH FLOOR OPENING
8	CUT COOLING TOWER PIPING AND PREPARE FOR CONNECTION TO NEW PIPING.
9	DISCONNECT COOLING TOWER PIPING AND PREPARE FOR CONNECTION TO NEW PIPING.
10	REMOVE HORIZONTAL 2" VENT PIPING. PREPARE VERTICAL PIPING FOR CONNECTION TO NEW 2" VT.
11	DISCONNECT VT TO REMAIN AND PREPARE FOR CONNECTION TO NEW VT

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SHEET
M103
3RD FLOOR PIPING DEMOLITION

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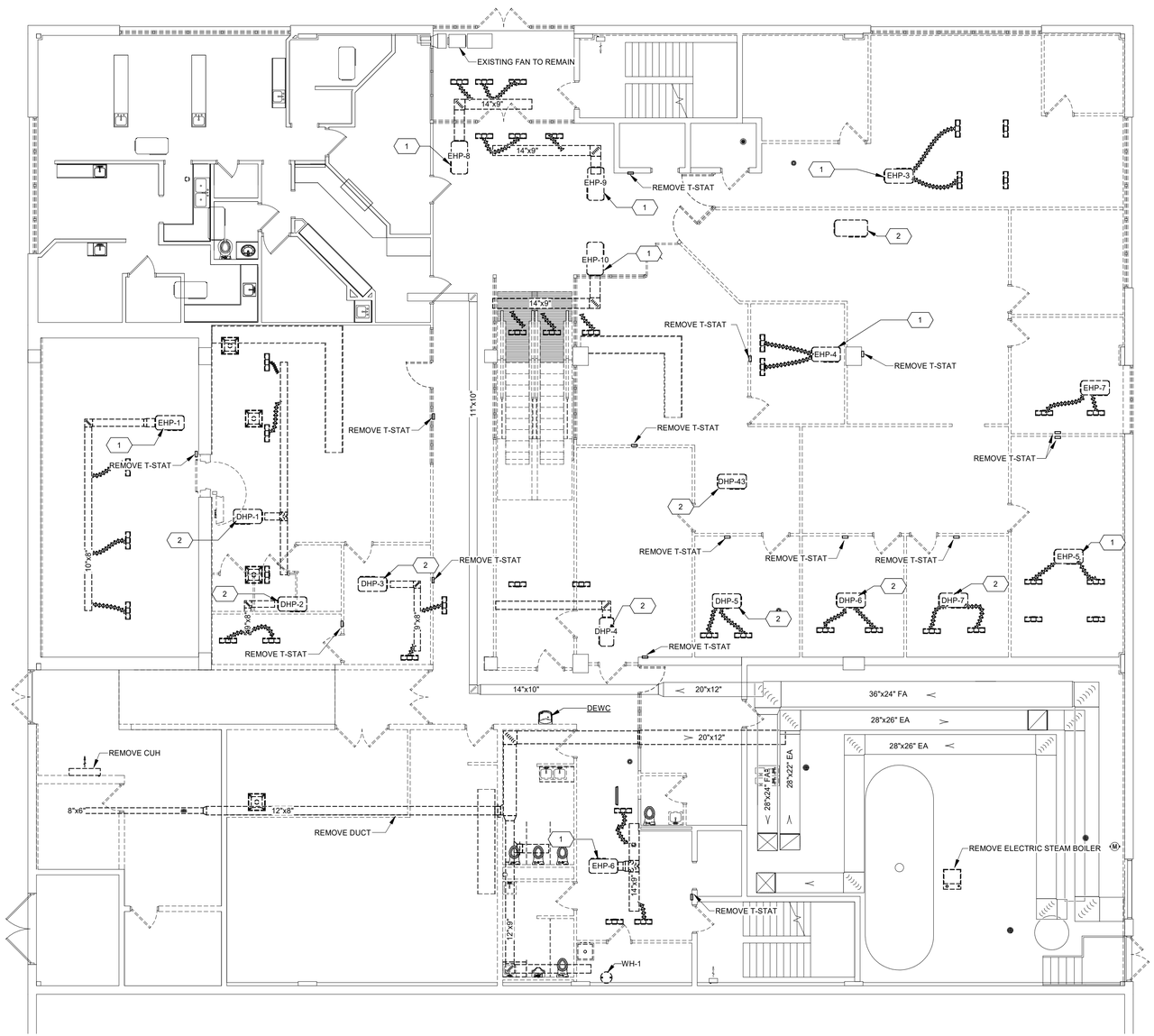

LINE TYPE LEGEND

- EXISTING
- NEW
- REMOVE
- HIDDEN
- MATCHLINE

HVAC LEGEND

- POSITIVE PRESSURE DUCT
- NEGATIVE PRESSURE DUCT
- MANUAL DAMPER
- MOTORIZED DAMPER
- FIRE DAMPER
- COMB. SMOKE/FIRE DAMPER
- BACK DRAFT DAMPER
- ACCESS DOOR
- ELBOW WITH TURNING VANES
- HI-EFFICENCY TAKEOFF (W/ VOLUME DAMPER)
- FLEXIBLE DUCT
- AIR TERMINAL TAG
- AIR TERMINAL MARK
- AIR TERMINAL CFM
- AIR TERMINAL SIZE

M1 395 30"x30"

Keynote Legend

1	DISCONNECT HEAT PUMP AND STORE FOR REUSE AND RELOCATED. REMOVE ALL DUCTWORK, FLEX DUCT, AND DIFFUSERS AS SHOWN. PRESERVE ATC CONTROLLER WITH HEAT PUMP.
2	REMOVE HEAT PUMP AND DUCTWORK, PIPING, AND DIFFUSERS. AS SHOWN.

1 M104

FIRST FLOOR HVAC DEMOLITION PLAN

1/8" = 1'-0"

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SHEET
M104
1ST FLOOR HVAC DEMOLITION

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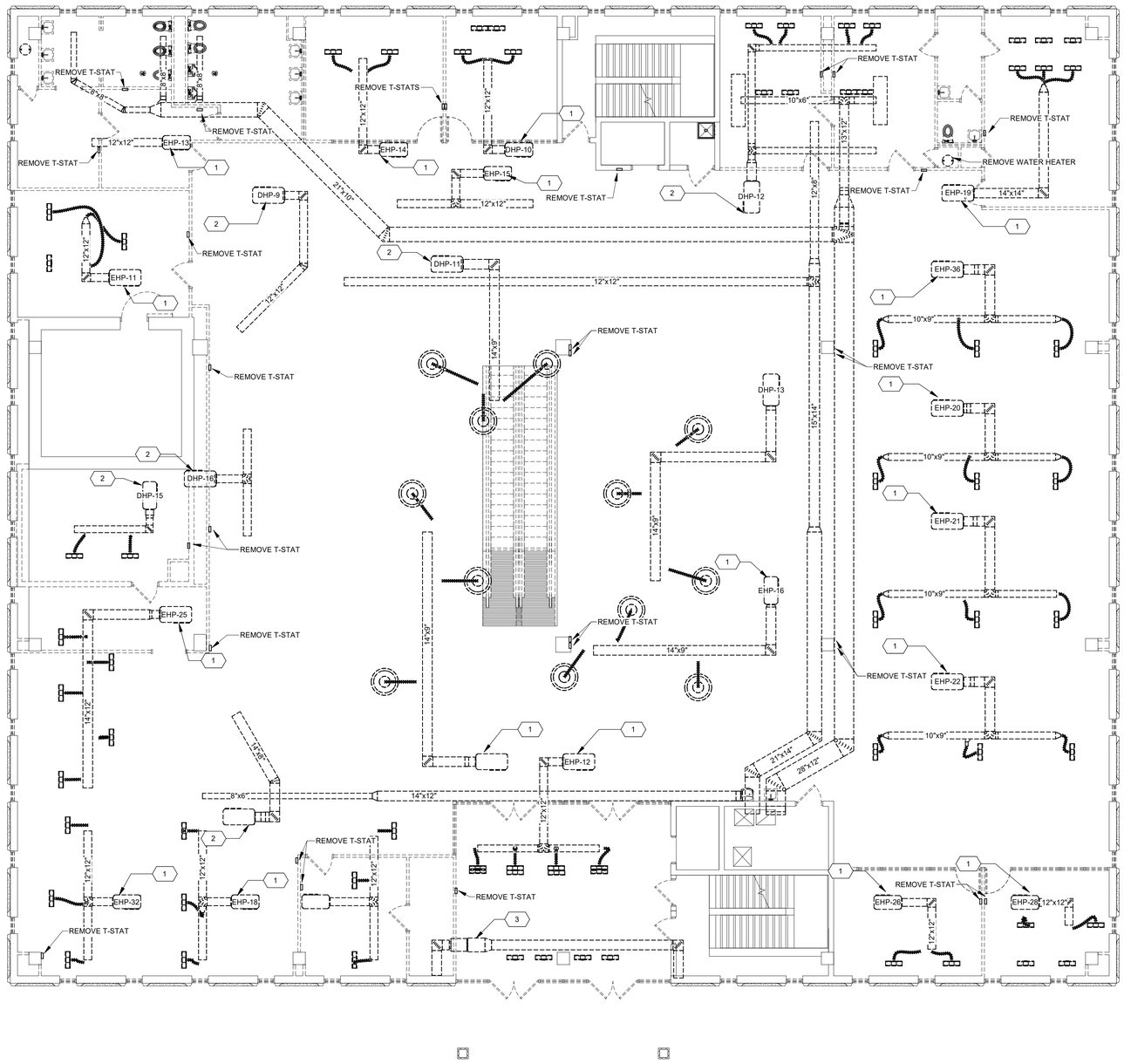

Keynote Legend

1	DISCONNECT HEAT PUMP AND STORE FOR REUSE AND RELOCATED. REMOVE ALL DUCTWORK, FLEX DUCT, AND DIFFUSERS AS SHOWN. PRESERVE ATC CONTROLLER WITH HEAT PUMP.
2	REMOVE HEAT PUMP AND DUCTWORK, PIPING, AND DIFFUSERS. AS SHOWN.
3	REMOVE FAN, DUCT HEATER, AND ATTACHED DUCT AND LINEAR GRILLES

HVAC LEGEND

- POSITIVE PRESSURE DUCT
- NEGATIVE PRESSURE DUCT
- MANUAL DAMPER
- MOTORIZED DAMPER
- FIRE DAMPER
- COMB. SMOKE/FIRE DAMPER
- BACK DRAFT DAMPER
- ACCESS DOOR
- ELBOW WITH TURNING VANES
- HI-EFFICENCY TAKEOFF (W/ VOLUME DAMPER)
- FLEXIBLE DUCT
- AIR TERMINAL TAG (M / V90)
- AIR TERMINAL MARK
- AIR TERMINAL CFM
- AIR TERMINAL SIZE (30"x30")

LINE TYPE LEGEND

- EXISTING
- NEW
- REMOVE
- HIDDEN
- MATCHLINE

1 M105 SECOND FLOOR HVAC DEMOLITION PLAN

1/8" = 1'-0"

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PROJECT 21019
SHEET M105
2ND FLOOR HVAC DEMOLITION

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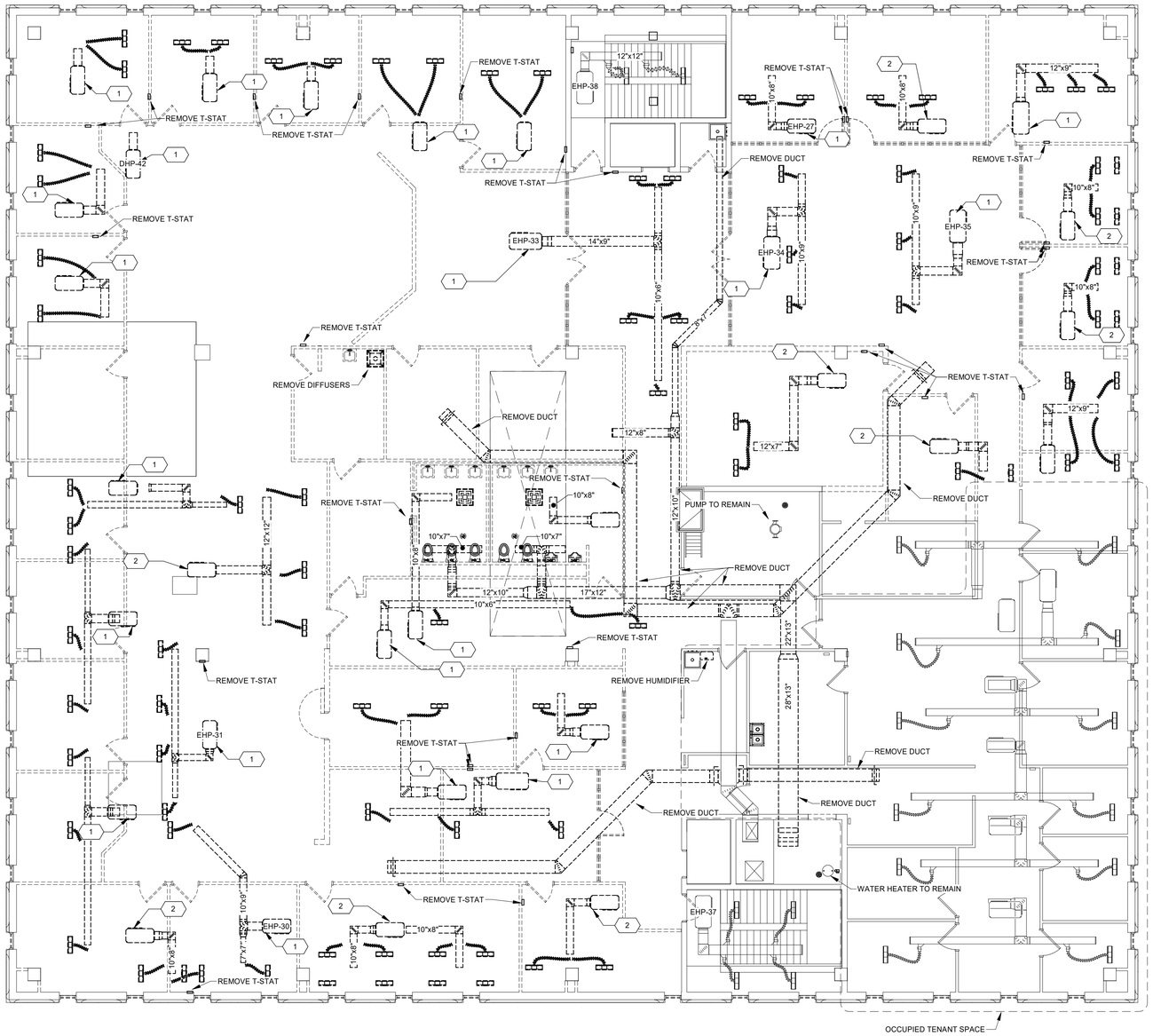

THIRD FLOOR HVAC DEMOLITION PLAN

1/8" = 1'-0"

LINE TYPE LEGEND

- EXISTING
- NEW
- REMOVE
- HIDDEN
- MATCHLINE

Keynote Legend

1	DISCONNECT HEAT PUMP AND STORE FOR REUSE AND RELOCATED. REMOVE ALL DUCTWORK, FLEX DUCT, AND DIFFUSERS AS SHOWN. PRESERVE ATC CONTROLLER WITH HEAT PUMP.
2	REMOVE HEAT PUMP AND DUCTWORK, PIPING, AND DIFFUSERS. AS SHOWN.

HVAC LEGEND

- POSITIVE PRESSURE DUCT
- NEGATIVE PRESSURE DUCT
- MANUAL DAMPER
- MOTORIZED DAMPER
- FIRE DAMPER
- COMB. SMOKE/FIRE DAMPER
- BACK DRAFT DAMPER
- ACCESS DOOR
- ELBOW WITH TURNING VANES
- HI-EFFICENCY TAKEOFF (W/ VOLUME DAMPER)
- FLEXIBLE DUCT
- AIR TERMINAL TAG
- AIR TERMINAL MARK
- AIR TERMINAL CFM
- AIR TERMINAL SIZE

M 899 30"x30"

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21019

SHEET
M106
3RD FLOOR HVAC DEMOLITION

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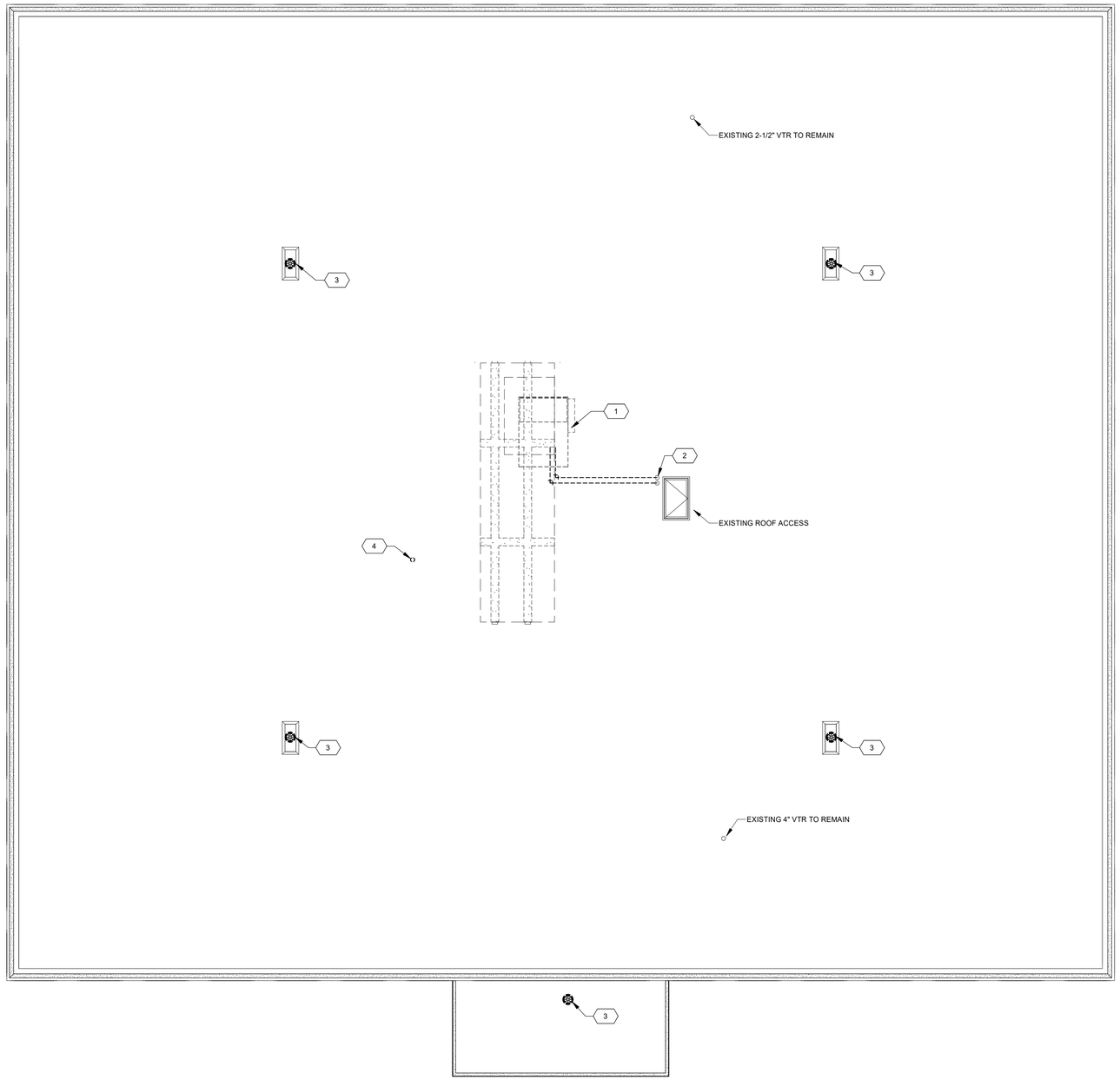

ROOF DEMOLITION PLAN

1/8" = 1'-0"

Keynote Legend	
1	UNDER BASE BID RELOCATE COOLING TOWER TO LOCATION SHOWN ON DRAWINGS. UNDER ALTERNATE BID REMOVE COOLING TOWER.
2	DISCONNECT COOLING TOWER PIPING AND PREPARE FOR CONNECTION TO NEW PIPING.
3	EXISTING ROOF DRAIN TO REMAIN UNDER BASE BID. REMOVE UNDER ROOFING ALTERNATE 12.
4	EXISTING 2-1/2" VTR. CAP UNDER BASE BID. REMOVE UNDER ROOFING ALTERNATE 12.

LINE TYPE LEGEND	
	EXISTING
	NEW
	REMOVE
	HIDDEN
	MATCHLINE

PIPING VALVE & ACCESSORY LEGEND	
	BALL VALVE
	BALL VALVE INDICATOR
	BUTTERFLY VALVE
	GATE VALVE
	VENTURI
	CHECK VALVE
	2-WAY HYDRONIC CONTROL VALVE
	2-WAY DOMESTIC CONTROL VALVE
	3-WAY CONTROL VALVE
	DRAIN VALVE
	STRAINER
	MANUAL AIR VENT
	AUTO AIR VENT
	TEMPERATURE GAUGE
	PRESSURE GAUGE
	SENSOR
	FLOW METER
	UNION

HVAC LEGEND

- POSITIVE PRESSURE DUCT
- NEGATIVE PRESSURE DUCT
- MANUAL DAMPER
- MOTORIZED DAMPER
- FIRE DAMPER
- COMB. SMOKE/FIRE DAMPER
- BACK DRAFT DAMPER
- ACCESS DOOR
- ELBOW WITH TURNING VANES
- HI-EFFICENCY TAKEOFF (W/ VOLUME DAMPER)
- FLEXIBLE DUCT

M 999 30"x30" — AIR TERMINAL TAG, AIR TERMINAL MARK, AIR TERMINAL CFM, AIR TERMINAL SIZE

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SHEET
M107
ROOF MECHANICAL DEMOLITION

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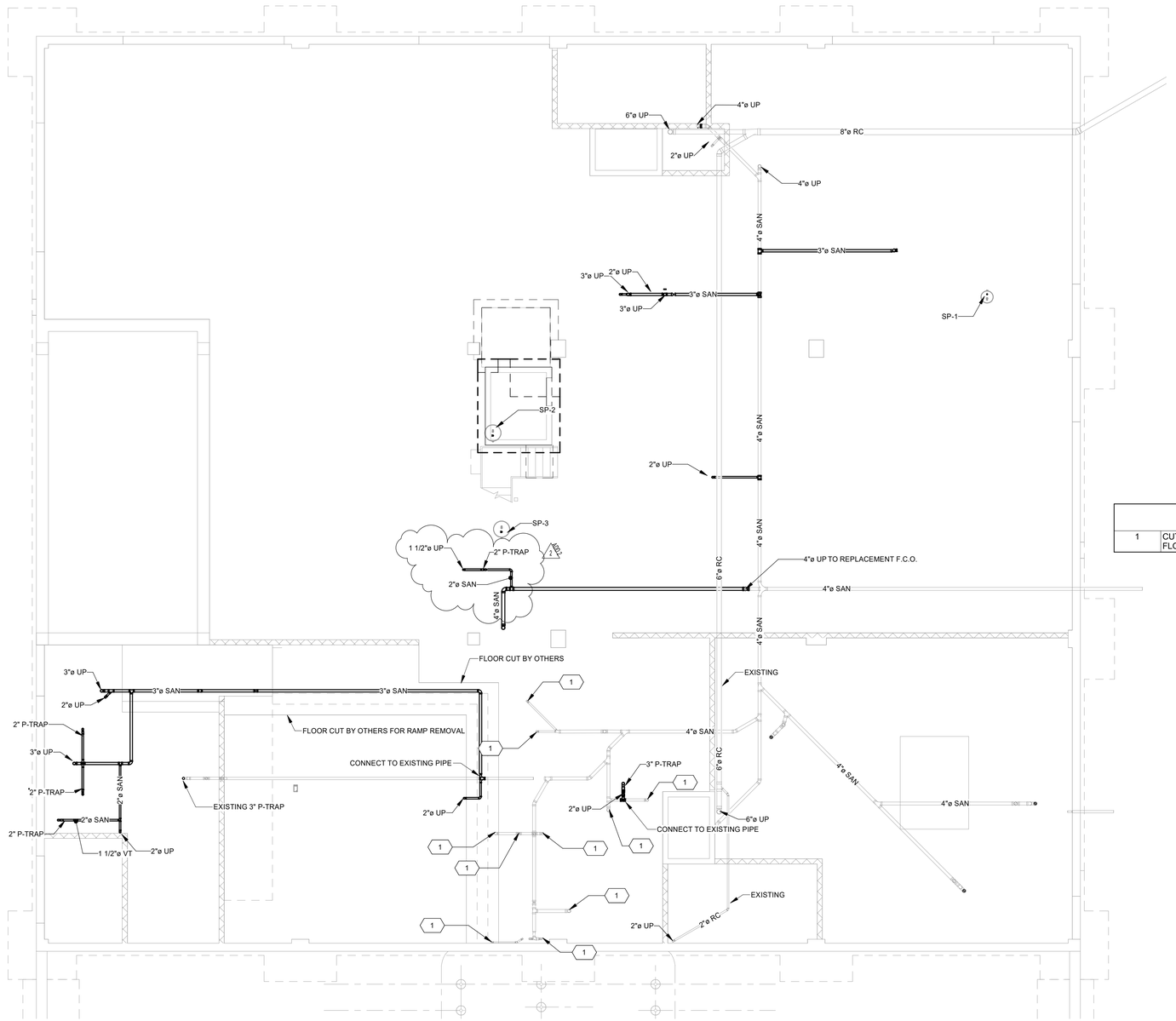

Keynote Legend	
1	CUT AND CAP WASTE LINES BELOW NEW FLOOR.

LINE TYPE LEGEND

- EXISTING
- NEW
- REMOVE
- HIDDEN
- MATCHLINE

PIPING LEGEND

- ABOVEGROUND WASTE
- UGW — UNDERGROUND WASTE
- VENT
- RC — RAIN CONDUCTOR
- CW — DOMESTIC COLD WATER
- DOMESTIC COLD WATER
- HW — DOMESTIC HOT WATER
- DOMESTIC HOT WATER
- RHW — RECIRC HOT WATER
- RECIRC HOT WATER
- 140 HW — HIGH TEMP HOT WATER
- ORC — OVERFLOW RAIN CONDUCTOR
- HWS — HOT WATER HTG SUPPLY
- HWR — HOT WATER HTG RETURN
- HWR — HOT WATER HTG RETURN
- HPS — HEAT PUMP SUPPLY
- HPR — HEAT PUMP RETURN
- HPR — HEAT PUMP RETURN
- COND — CONDENSATE DRAIN
- CTS — CHILLED TOWER SUPPLY
- CTR — CHILLED TOWER RETURN
- G — NATURAL GAS

UNDERGROUND PLUMBING PLAN

1/8" = 1'-0"

1 / M201

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NO.	DESCRIPTION	DATE
1	Addendum #1	11/12/21
2	Addendum #2	11/18/21

CITY OF MINOT
MINOT CITY HALL RENOVATION
MINOT, ND

CITY PROJECT 4466

DATE
11/04/21

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SHEET
M201
UNDERGROUND PLUMBING

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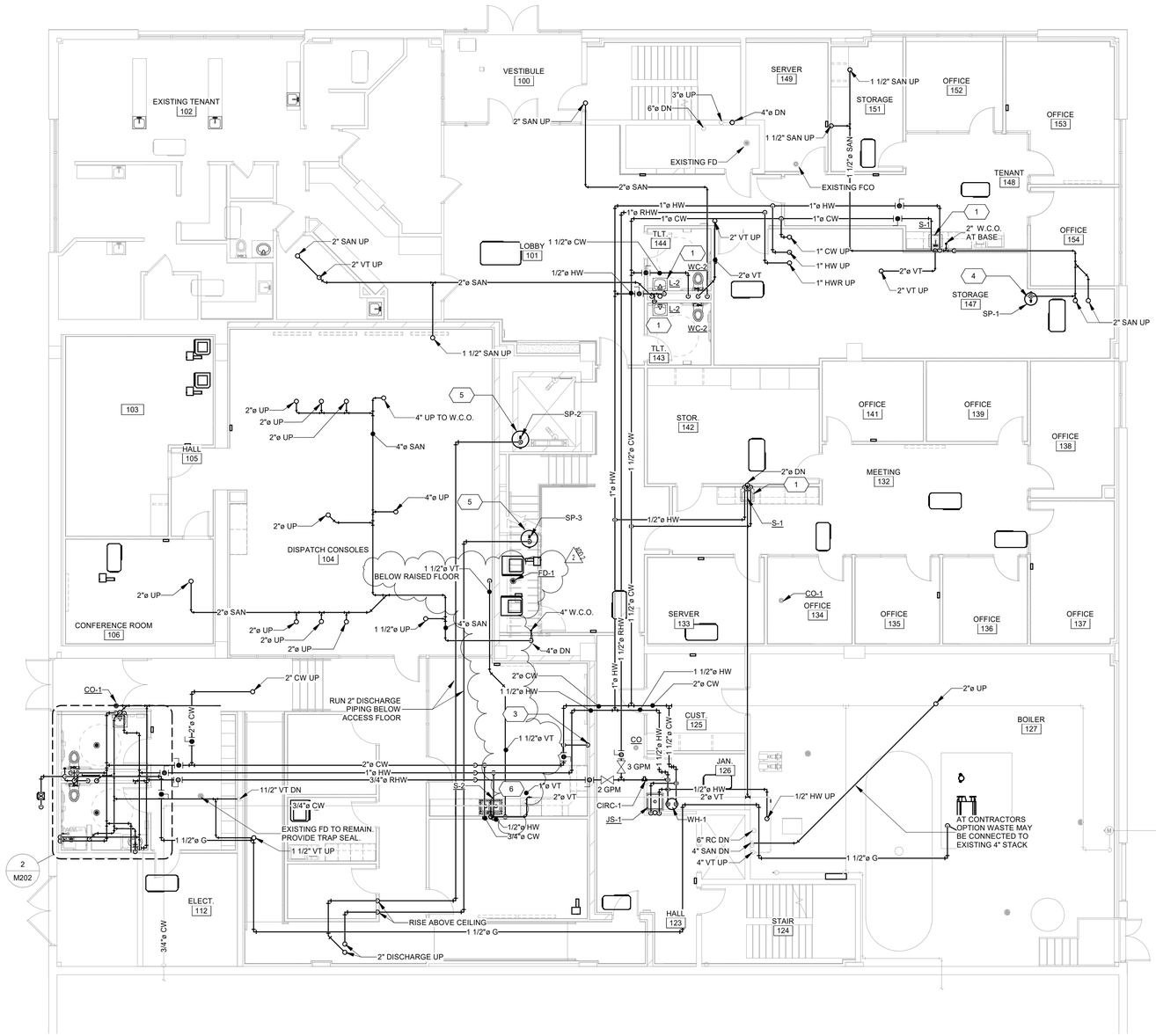


Keynote Legend

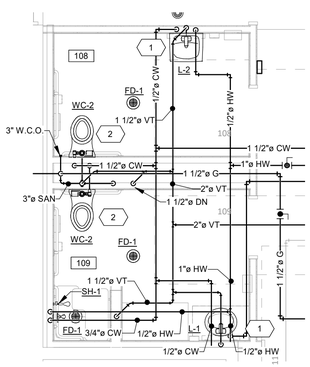
1	PROVIDE 1/2" CW/HW, 2" WASTE, 1-1/2" VENT TO LAVATORY/SINK
2	PROVIDE 1-1/2" CW, 3" WASTE, 2" VT TO WATER CLOSET
3	PROVIDE 1/2" CW WITH BALL VALVE TO ICE MAKER OUTLET BOX 12" AFF BEHIND OWNER FURNISHED FRIDGE. AFTER FLUSHING AND TESTING, CLOSE BALL VALVE AND DRAIN SUPPLY LINE AT STOP.
4	PROVIDE 1 1/2" DISCHARGE WITH BALL VALVE AND CHECK VALVE (COMBO ACCEPTABLE) TO 2" SANITARY DRAIN OVERHEAD. DISCHARGE CONNECTION TO BE TO TOP HALF OF DRAIN WITH DWV TEE.
5	PROVIDE 20 DFU AIR ADMITTANCE DEVICE ON COVER'S VENT CONNECTION.
6	OWNER FURNISHED DISHWASHER. PROVIDE DISHWASHER TEE IN TAIL PIECE. PROVIDE STANDARD LENGTH DRAIN HOSE FROM DISHWASHER TO DISPOSAL TEE. PROVIDE 1/2" OUTLET QUARTER TURN STOP ON HOT WATER IN SINK CABINET. PROVIDE 1/2" SOFT COPPER OR PLEX SUPPLY AT BACK OF CABINETS TO DISHWASHER WATER CONNECTION.

PIPING VALVE & ACCESSORY LEGEND

	BALL VALVE
	BALL VALVE INDICATOR
	BUTTERFLY VALVE
	GATE VALVE
	VENTURI
	CHECK VALVE
	2-WAY HYDRONIC CONTROL VALVE
	2-WAY DOMESTIC CONTROL VALVE
	3-WAY CONTROL VALVE
	DRAIN VALVE
	STRAINER
	MANUAL AIR VENT
	AUTO AIR VENT
	TEMPERATURE GAUGE
	PRESSURE GAUGE
	SENSOR
	FLOW METER
	UNION

PIPING LEGEND

——–·–·–——	ABOVEGROUND WASTE
——UGW——	UNDERGROUND WASTE
——– – – ——	VENT
——RC——	RAIN CONDUCTOR
——CW——	DOMESTIC COLD WATER
——–·–——	DOMESTIC COLD WATER
——HW——	DOMESTIC HOT WATER
——–··–——	DOMESTIC HOT WATER
——RHW——	RECIRC HOT WATER
——–···–——	RECIRC HOT WATER
—140 HW——	HIGH TEMP HOT WATER
——ORC——	OVERFLOW RAIN CONDUCTOR
——HWS——	HOT WATER HTG SUPPLY
— –HWR– —	HOT WATER HTG RETURN
— –HWR– —	HOT WATER HTG RETURN
——HPS——	HEAT PUMP SUPPLY
——HPR——	HEAT PUMP RETURN
— –HPR– —	HEAT PUMP RETURN
——COND——	CONDENSATE DRAIN
——CTS——	CHILLED TOWER SUPPLY
——CTR——	CHILLED TOWER RETURN
——G——	NATURAL GAS



2 M202 ENLARGED 1ST FLOOR PLUMBING
1/4" = 1'-0"

1 M202 FIRST FLOOR PLUMBING PLAN
1/8" = 1'-0"

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2	Addendum #2	11/18/21

CITY OF MINOT
MINOT CITY HALL RENOVATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET M202
1ST FLOOR PLUMBING

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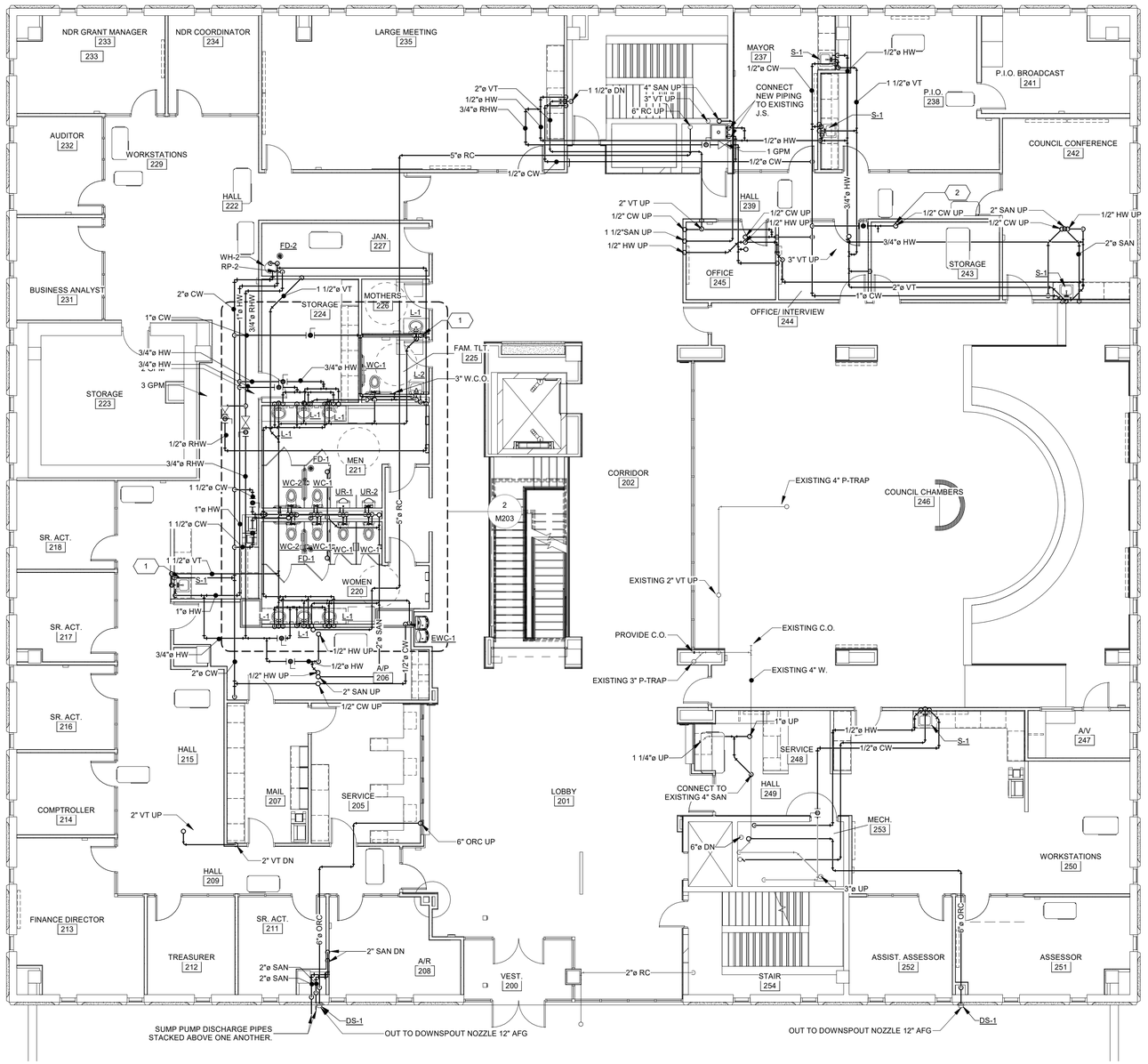
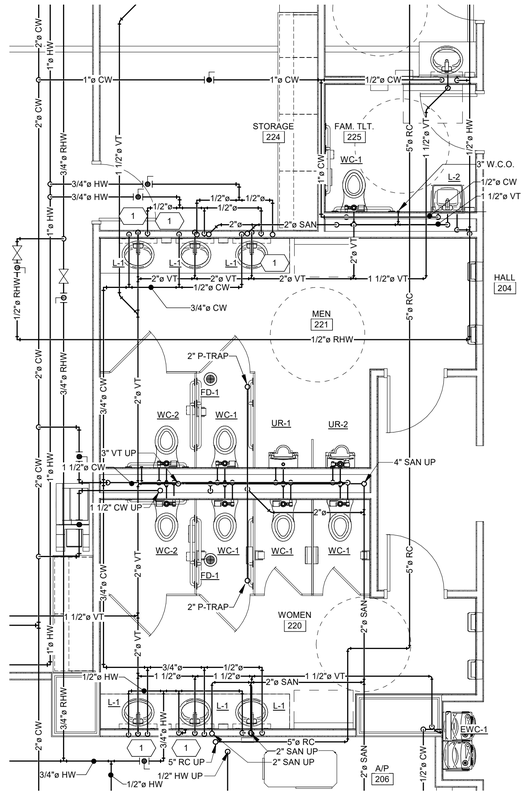


1 M203 SECOND FLOOR PLUMBING PLAN
1/8" = 1'-0"

Keynote Legend	
1	PROVIDE 1/2" CW/HW, 2" WASTE, 1-1/2" VENT TO LAVATORY/SINK
2	PROVIDE BALL VALVE ON 1/2" CW UP TO FRIDGES. AFTER FLUSHING AND TESTING CLOSE SHUTOFF VALVE AND DRAIN LINE WITH DRAIN VALVE WITH THREADED MPT OR GARDEN HOSE CONNECTION. PROVIDE CAP OR PLUG ON OUTLET.

PIPING VALVE & ACCESSORY LEGEND	
	BALL VALVE
	BALL VALVE INDICATOR
	BUTTERFLY VALVE
	GATE VALVE
	VENTURI
	CHECK VALVE
	2-WAY HYDRONIC CONTROL VALVE
	2-WAY DOMESTIC CONTROL VALVE
	3-WAY CONTROL VALVE
	DRAIN VALVE
	STRAINER
	MANUAL AIR VENT
	AUTO AIR VENT
	TEMPERATURE GAUGE
	PRESSURE GAUGE
	SENSOR
	FLOW METER
	UNION

PIPING LEGEND	
——– – ——–	ABOVEGROUND WASTE
—UGW——	UNDERGROUND WASTE
——– – – ——–	VENT
—RC——	RAIN CONDUCTOR
—CW——	DOMESTIC COLD WATER
——– · ——–	DOMESTIC COLD WATER
—HW——	DOMESTIC HOT WATER
——– ·· ——–	DOMESTIC HOT WATER
—RHW——	RECIRC HOT WATER
——– ··· ——–	RECIRC HOT WATER
—140 HW——	HIGH TEMP HOT WATER
—ORC——	OVERFLOW RAIN CONDUCTOR
—HWS——	HOT WATER HTG SUPPLY
— -HWR— —	HOT WATER HTG RETURN
— -HWR— —	HOT WATER HTG RETURN
—HPS——	HEAT PUMP SUPPLY
—HPR——	HEAT PUMP RETURN
— -HPR— —	HEAT PUMP RETURN
—COND——	CONDENSATE DRAIN
—CTS——	CHILLED TOWER SUPPLY
—CTR——	CHILLED TOWER RETURN
——G——	NATURAL GAS



2 M203 ENLARGED 2ND FLOOR PLUMBING
1/4" = 1'-0"

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SHEET M203
2ND FLOOR PLUMBING

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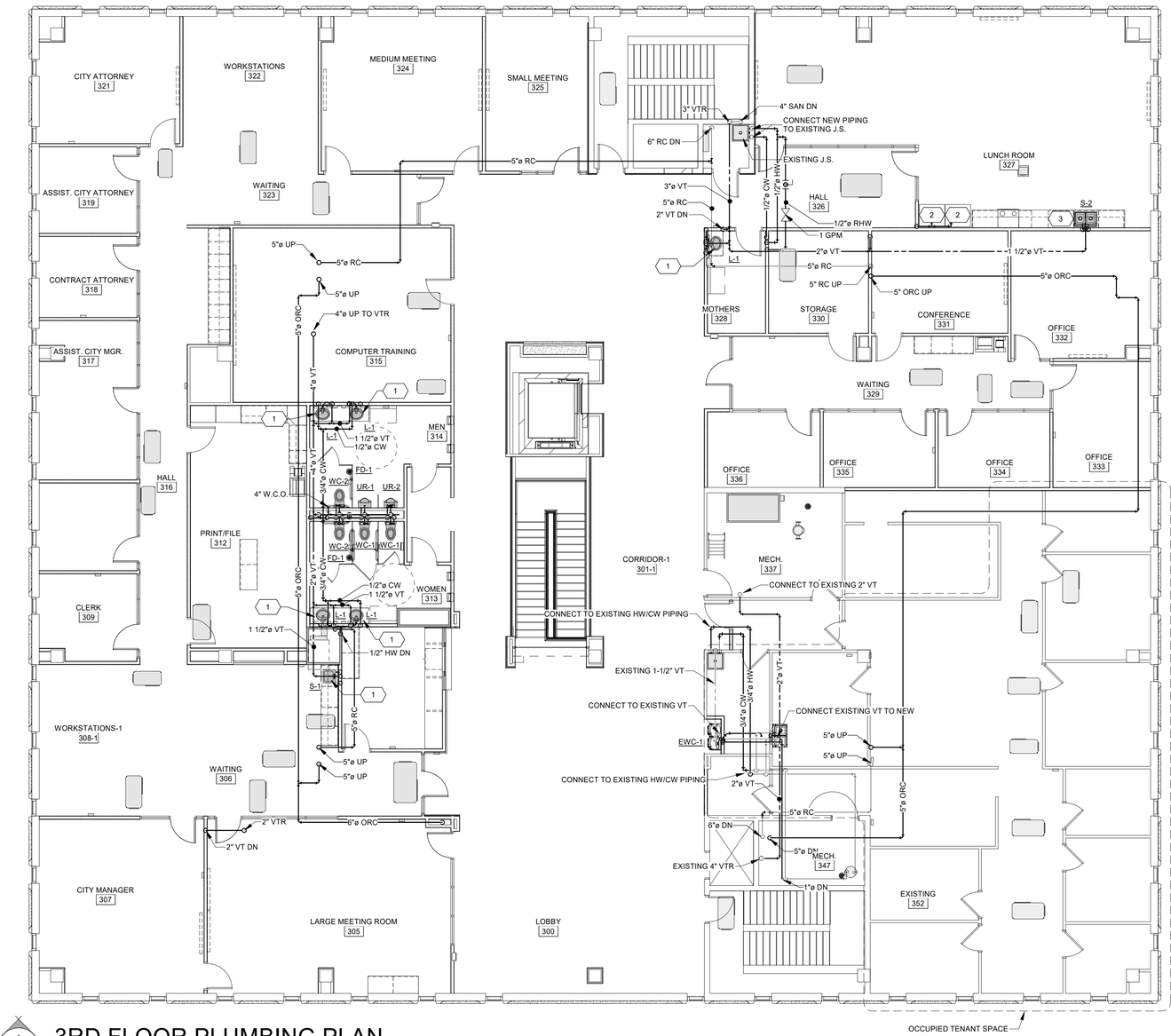

1 M204 — 3RD FLOOR PLUMBING PLAN

1/8" = 1'-0"

Keynote Legend

1	PROVIDE 1/2" CW/HW, 2" WASTE, 1-1/2" VENT TO LAVATORY/SINK
2	1/2" CW TO ICE MAKER BEHIND EACH OWNER FURNISHED FRIDGE.
3	OWNER FURNISHED DISHWASHER. PROVIDE DISHWASHER TEE IN TAIL PIECE. PROVIDE CUSTOM LENGTH DRAIN HOSE FROM DISHWASHER TO DISPOSAL TEE. PROVIDE 1/2" OUTLET QUARTER TURN STOP ON HOT WATER IN SINK CABINET. PROVIDE 1/2" SOFT COPPER OR PLEX SUPPLY AT BACK OF CABINETS TO DISHWASHER WATER CONNECTION.

PIPING VALVE & ACCESSORY LEGEND

	BALL VALVE
	BALL VALVE INDICATOR
	BUTTERFLY VALVE
	GATE VALVE
	VENTURI
	CHECK VALVE
	2-WAY HYDRONIC CONTROL VALVE
	2-WAY DOMESTIC CONTROL VALVE
	3-WAY CONTROL VALVE
	DRAIN VALVE
	STRAINER
	MANUAL AIR VENT
	AUTO AIR VENT
	TEMPERATURE GAUGE
	PRESSURE GAUGE
	SENSOR
	FLOW METER
	UNION

PIPING LEGEND

	ABOVEGROUND WASTE
—UGW—	UNDERGROUND WASTE
	VENT
—RC—	RAIN CONDUCTOR
—CW—	DOMESTIC COLD WATER
	DOMESTIC COLD WATER
—HW—	DOMESTIC HOT WATER
	DOMESTIC HOT WATER
—RHW—	RECIRC HOT WATER
	RECIRC HOT WATER
—140 HW—	HIGH TEMP HOT WATER
—ORC—	OVERFLOW RAIN CONDUCTOR
—HWS—	HOT WATER HTG SUPPLY
—HWR—	HOT WATER HTG RETURN
—HWR—	HOT WATER HTG RETURN
—HPS—	HEAT PUMP SUPPLY
—HPR—	HEAT PUMP RETURN
—HPR—	HEAT PUMP RETURN
—COND—	CONDENSATE DRAIN
—CTS—	CHILLED TOWER SUPPLY
—CTR—	CHILLED TOWER RETURN
—G—	NATURAL GAS

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MINOT CITY HALL RENOVATION
MINOT, ND

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M204
3RD FLOOR PLUMBING

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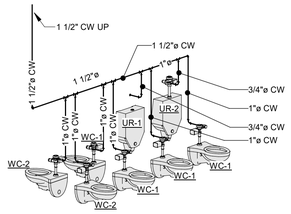
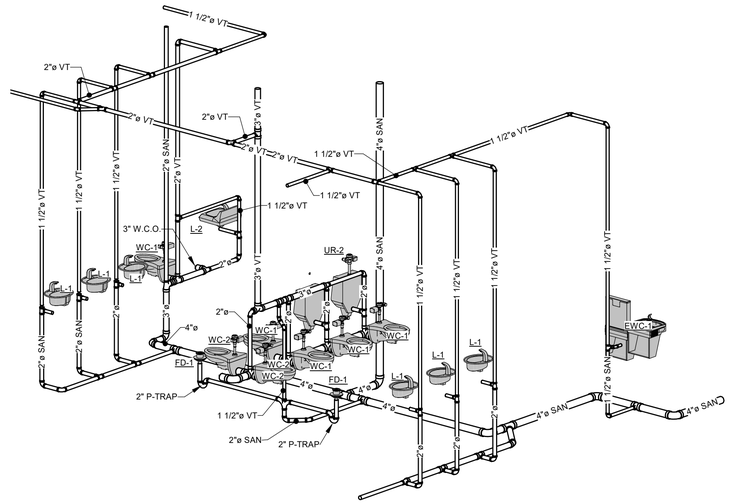
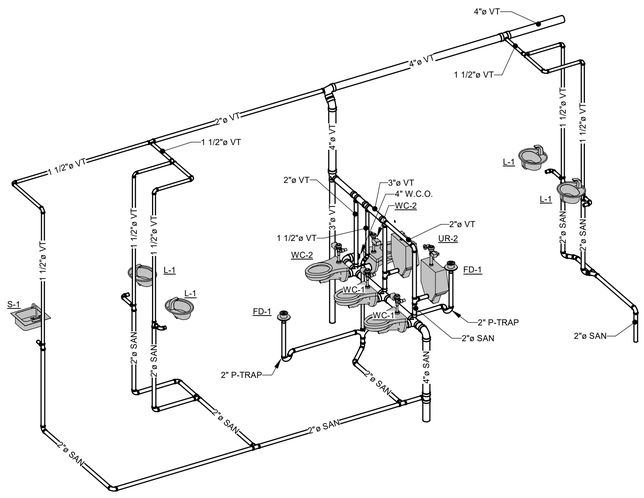


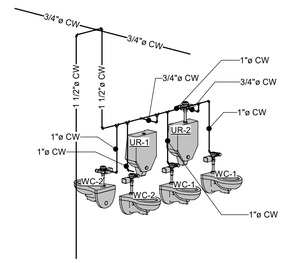
1 2ND FLOOR TOILET SUPPLY RISER
M205



2 2ND FLOOR TOILET DWV RISER
M205



3 THRID FLOOR TOILET DWV RISER
M205



4 THIRD FLOOR WATER RISER
M205

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SHEET M205
PLUMBING RISERS

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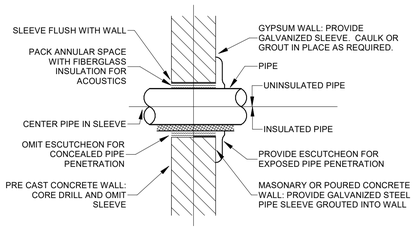
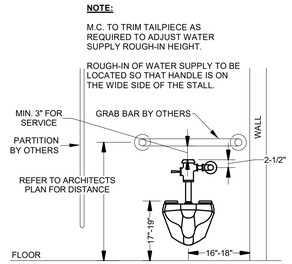
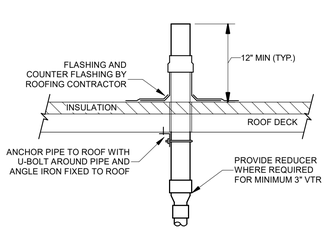


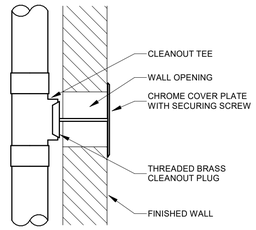
1 M206 PIPE PENETRATION OF NON-RATED WALL
NTS



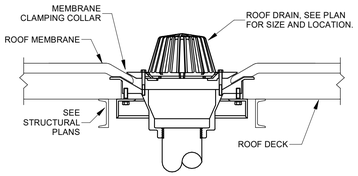
10 M206 ADA WATER CLOSET DETAIL
NTS



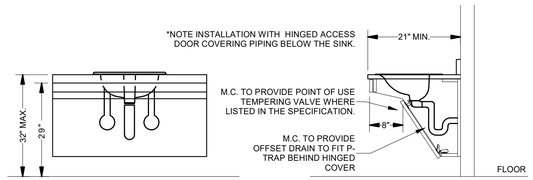
2 M206 VENT THRU ROOF (VTR)
NTS



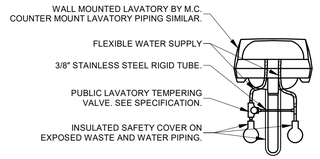
3 M206 WALL CLEANOUT DETAIL
NTS



4 M206 ROOF DRAIN DETAIL
NTS



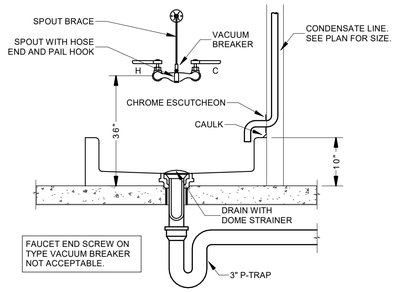
5 M206 ADA LAVATORY DETAIL
NTS



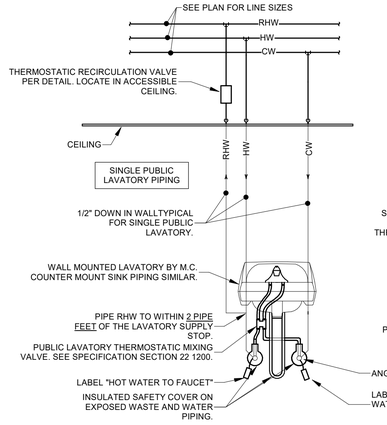
6 M206 LAVATORY TEMPERING VALVE DETAIL
NTS

8 M206 ADA URINAL DETAIL
NTS

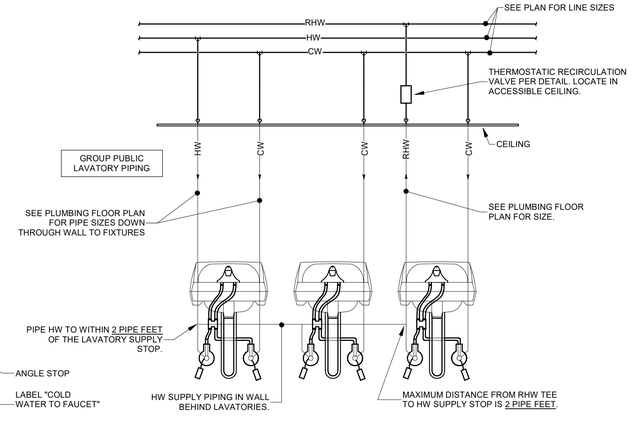
9 M206 ADA LAVATORY DETAIL
NTS

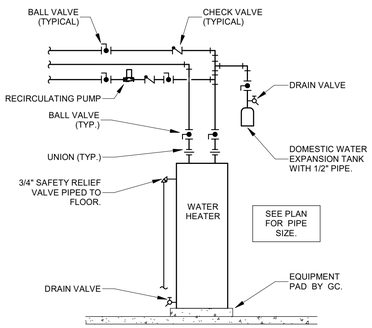


11 M206 MOP SINK DETAIL
NTS



12 M206 PUBLIC LAVATORY PIPING DETAIL
NTS





13 M206 WATER HEATER PIPING DETAIL
NTS

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REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
MINOT CITY HALL RENOVATION
MINOT, ND

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223000 - SUMP PUMP SCHEDULE

SCHEDULE NOTES:

1. SEE DETAIL FOR ACCESSORIES
2. AUTOMATIC PUMP CONTROL WITH HIGH WATER ALARM AND CONTACT FOR BAS ALARM
3. PROVIDE PUMPS WITH 15' CORDS

MARK	MANUFACTURER	MODEL	TYPE	GPM	FT of HD	MOTOR INFORMATION					NOTES
						BHP	HP	V	Ph	Hz	
SP-1	ZOELLER	53		0 GPM	0 ftH2O	0 hp	0.3 hp	115 V	1	60 Hz	
SP-2	ZOELLER	98		0 GPM	0 ftH2O	0 hp	0 hp	0 V	1	60 Hz	
SP-3	ZOELLER	153		22 GPM	35 ftH2O	0 hp	0.5 hp	115 V	1	60 Hz	

224000 - PLUMBING FIXTURE SCHEDULE

SCHEDULE NOTES:

1. SCHEDULE IS ABBREVIATED. SEE PLUMBING SPECIFICATIONS SECTION 224000 FOR FULL SPECIFICATIONS.
2. SEE ARCHITECTURAL DRAWINGS FOR MOUNTING HEIGHTS
3. SEAL JOINTS BETWEEN FIXTURES AND FLOORS/WALLS WITH MILDEW RESISTANT SEALANT. MATCH COLOR TO FIXTURE

TAG	FIXTURE			ADA	FAUCET/VALVE			DESCRIPTION
	TYPE	MFR	MODEL		MFR	MODEL	OPTION	
JS-1	MOP SERVICE BASIN	FIAT	MSB2424	No	CHICAGO FAUCETS	897-CP	2" LEVER HANDLES	24"x24" MOLDED STONE RECEPTOR, SS DOME STRAINER; WALL FAUCET WITH BRACE & PAIL HOOK; HOSE & BRACKET, MOP HANGER
SH-1	INSTITUTIONAL SHOWER	BRADLEY	WS-1WCA-BF-EF-ST-SD-SHV-SC	No	N/A	N/A	SINGLE HANDLE	18 GAUGE STEEL SHOWER PANEL WITH S.S. SOAP DISH MOUNTED TO PANEL, BOTTOM COVER IS SLOPED 16 GA. S.S., MAX. 2.0 GPM, FLEXIBLE S.S. STEEL HOSE SUPPLIES, HAND HELD SHOWER, S.S. SHROUD TO CEILING.
UR-1	URINAL	KOHLER	K-4991-ET	No	SLOAN	OPTIMA 8180	SENSOR	WALL HUNG, SIPHON JET, 0.5 GPF, VITREOUS CHINA, CARRIER, BATTERY POWERED SENSOR FLUSH VALVE
WC-1	WATER CLOSET	KOHLER	K-4325	No	SLOAN	ROYAL 111	SENSOR	ELONGATED BOWL, WALL HUNG, 1.6 GPF, VITREOUS CHINA, FLUSH VALVE, OPEN FRONT SEAT
EWC-1	WATER COOLER	ELKAY	EZTL8C	Yes	n/a	n/a	n/a	SURFACE WALL MOUNT, SS BASIN, INTEGRAL DRAIN GRIDS, TWO LEVEL WHEELCHAIR ACCESSIBLE, FRONT PUSH-BARS, BOTTLE FILLING STATION, 120V, PROVIDE FOR SINGLE POINT SINGLE PLUG POWER CONNECTION.
L-1	LAVATORY	BY G.C.	BY G.C.	Yes	KOHLER	K-15198	SINGLE HANDLE	COUNTER MOUNT, SELF-RIMMING, VITREOUS CHINA, OVAL, SENSOR FAUCET, 1.5 GPM.
L-2	LAVATORY	KOHLER	K-2005	Yes	KOHLER	K-15198	SINGLE HANDLE	WALL MOUNTED, VITREOUS CHINA, 21"X18", SINGLE HANDLE FAUCET, 1.5 GPM, DRILLED FOR CONCEALED ARM CARRIER
S-1	SINK - GENERAL PURPOSE	ELKAY	LR-1517	Yes	DELTA	9982-AR-PR-DST	MANUAL	15"X17" SINGLE COMPARTMENT, COUNTER MOUNTED, SELF-RIMMING, SINGLE HANDLE GOOSENECK FAUCET WITH PULLDOWN SPRAY, 2.2 GPM
S-2	KITCHEN SINK	ELKAY	LR-3321	Yes	DELTA	9182-AR-PR-DST	MANUAL	33"X21" DOUBLE COMPARTMENT, COUNTER MOUNTED, 8" BOWL DEPTH, SINGLE HANDLE GOOSENECK FAUCET WITH PULLDOWN SPRAY, 1.8 GPM
UR-2	URINAL	KOHLER	K-5016-ET	Yes	SLOAN	OPTIMA 8180	SENSOR	WALL HUNG, SIPHON JET, 0.5 GPF, VITREOUS CHINA, CARRIER, ADA HANGING HEIGHT, BATTERY POWERED SENSOR FLUSH VALVE
WC-2	WATER CLOSET	KOHLER	K-4325	Yes	SLOAN	ROYAL 111	SENSOR	ELONGATED BOWL, WALL HUNG, 1.6 GPF, VITREOUS CHINA, FLUSH VALVE, OPEN FRONT SEAT MOUNTED AT ADA COMPLIANT HEIGHT, ADA COMPLIANT FLUSH VALVE HANDLE

221400 - STORM DRAINAGE SPECIALTIES

SCHEDULE NOTES:

1. CONTRACTOR SHALL VERIFY QUANTITIES

TAG	QTY	TYPE	MANUFACTURER	MODEL	DESCRIPTION
DS-1	2	DOWNSPOUT	WATTS	RD-946P	
RD-1	8	ROOF DRAIN	Zurn Industries	Z100	15" DIAMETER MAIN DRAIN LOW SILHOUETTE DOME
RD-2	4	ROOF DRAIN	Zurn Industries	Z100	15" DIAMETER MAIN DRAIN LOW SILHOUETTE DOME AND 2" HIGH EXTERNAL WATER DAM
RD-3	2	ROOF DRAIN	Zurn Industries	Z100	15" DIAMETER MAIN DRAIN LOW SILHOUETTE DOME

221300 - WASTE FIXTURE SCHEDULE

SCHEDULE NOTES:

1. CONTRACTOR SHALL VERIFY QUANTITIES

TAG	QTY	TYPE	MFR	MODEL	DESCRIPTION
FD-1	7	FLOOR DRAIN	WATTS	FD-102-A5	Finished Area Floor Drain with Round Strainer
FD-2	1	FLOOR DRAIN	WATTS	FD-100	Finished Area Floor Drain with Round Strainer

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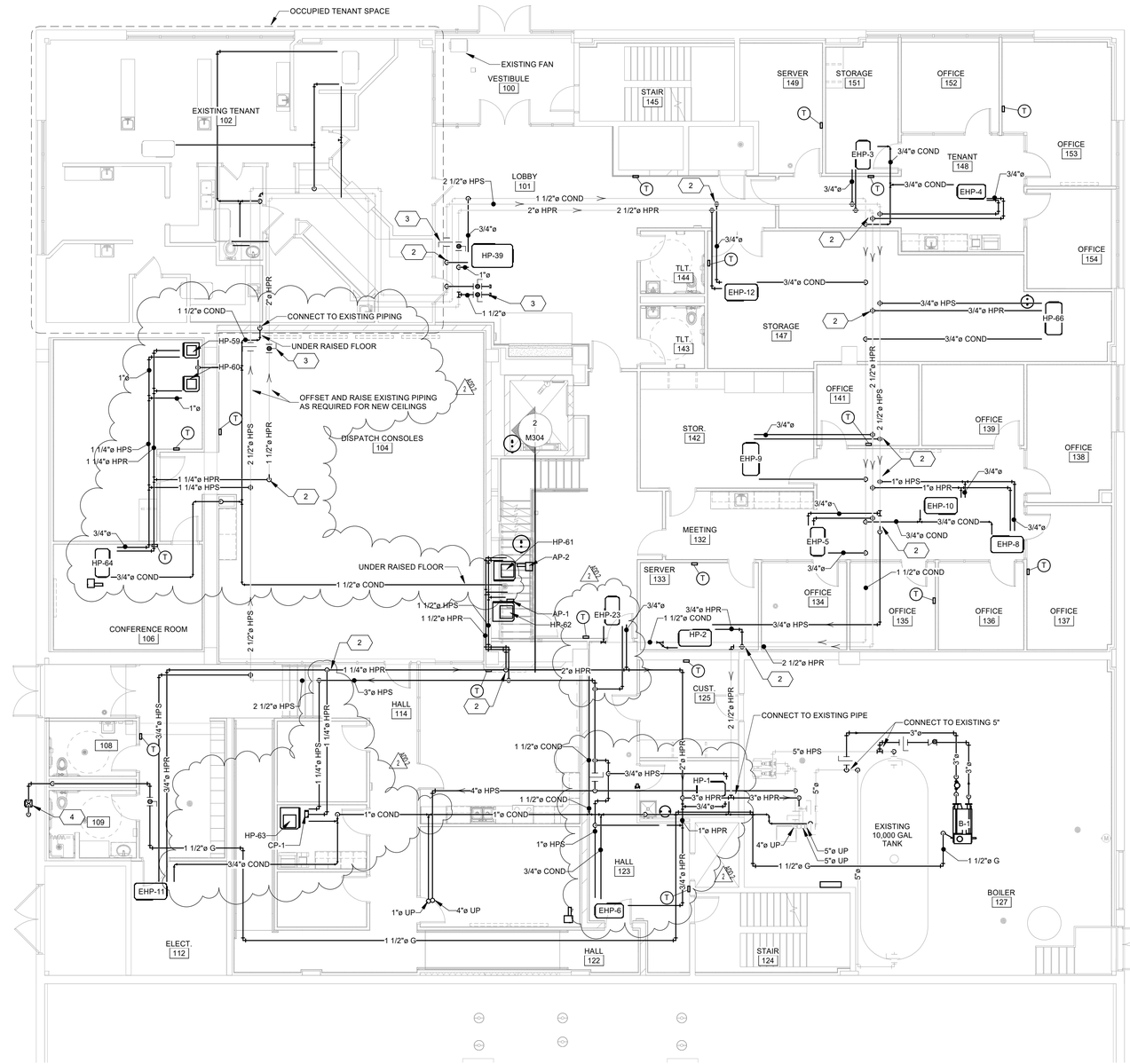
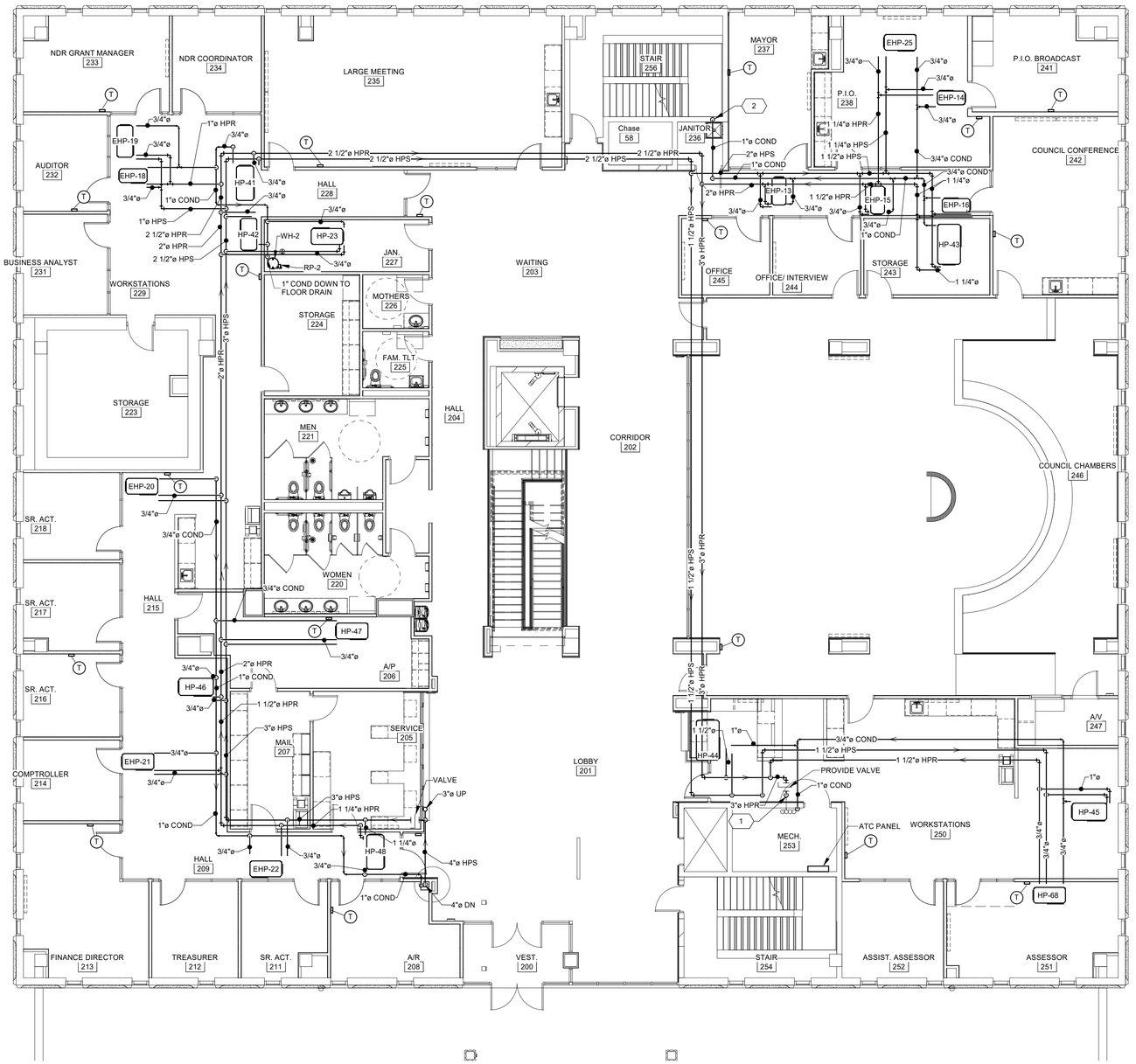

OCCUPIED TENANT SPACE
EXISTING TENANT 102
EXISTING FAN
VESTIBULE 100
LOBBY 101
STAIR 145
SERVER 149
STORAGE 151
OFFICE 152
OFFICE 153
TENANT 148
OFFICE 154
OFFICE 139
OFFICE 138
OFFICE 141
OFFICE 134
OFFICE 135
OFFICE 136
OFFICE 137
TLT. 144
TLT. 143
STORAGE 147
STOR. 142
MEETING 132
SERVER 133
CONFERENCE ROOM 106
DISPATCH CONSOLES 104
HALL 114
CUST. 125
HALL 123
HALL 122
STAIR 124
ELECT. 112
BOILER 127
108
109
EXISTING 10,000 GAL TANK
CONNECT TO EXISTING PIPING
UNDER RAISED FLOOR
OFFSET AND RAISE EXISTING PIPING AS REQUIRED FOR NEW CEILINGS
CONNECT TO EXISTING PIPE
CONNECT TO EXISTING 5"
HP-39
HP-59
HP-60
HP-64
HP-61
AP-2
AP-1
HP-62
EHP-23
HP-2
HP-1
HP-66
HP-63
CP-1
EHP-11
EHP-6
EHP-3
EHP-4
EHP-12
EHP-9
EHP-10
EHP-5
EHP-8
B-1
2 1/2"ø HPS
2 1/2"ø HPR
1 1/2"ø COND
2"ø HPR
1 1/2"ø HPS
1 1/4"ø HPS
1 1/4"ø HPR
3/4"ø COND
1 1/2"ø COND
1"ø HPS
1"ø HPR
3/4"ø HPS
3/4"ø HPR
4"ø HPS
5"ø HPS
1 1/2"ø G
1"ø UP
4"ø UP
5"ø UP
2"ø HPR
3"ø HPS
1 1/4"ø HPR
1"ø COND
3/4"ø COND
1 1/2"ø HPR
3/4"ø HPR
3"ø HPR
1"ø HPS
3/4"ø COND
1 1/2"ø G
1 1/2"ø HPS
1 1/2"ø HPR
3/4"ø HPR
1 1/2"ø COND
3/4"ø HPS
2 1/2"ø HPR
3/4"ø COND
1"ø HPR
1 1/2"ø G
5"ø UP
5"ø UP
1 1/2"ø G
5"ø
3"ø
3"ø
3"ø
5"ø
3/4"ø
1"ø
1 1/2"ø
3/4"ø
3/4"ø COND
3/4"ø
3/4"ø COND
3/4"ø COND
3/4"ø
1 1/2"ø COND
3/4"ø
3/4"ø HPS
3/4"ø HPR
3/4"ø COND
1"ø
1"ø
1 1/4"ø HPS
1 1/4"ø HPR
1 1/4"ø HPR
1 1/4"ø HPS
3/4"ø
3/4"ø COND
1 1/2"ø COND
1 1/2"ø HPS
1 1/2"ø HPR
2"ø HPR
1 1/4"ø HPR
3"ø HPS
2 1/2"ø HPS
1 1/4"ø HPS
1 1/4"ø HPR
3/4"ø HPS
3/4"ø HPR
1 1/2"ø COND
4"ø HPS
1 1/2"ø COND
1"ø COND
1"ø COND
1"ø HPR
1"ø HPS
3/4"ø COND
1"ø UP
4"ø UP
1 1/2"ø G
2"ø HPR
3/4"ø HPR
2 1/2"ø HPR
2 1/2"ø HPS
2 1/2"ø HPR
2 1/2"ø HPS
2 1/2"ø HPR
2 1/2"ø HPS



Keynote Legend	
1	CONNECT NEW HP PIPING TO EXISTING HPS/HPR/COND PIPING
2	PIPE CONDENSATE DOWN TO DRAIN INTO MOP SINK

PIPING VALVE & ACCESSORY LEGEND

	BALL VALVE
	BALL VALVE INDICATOR
	BUTTERFLY VALVE
	GATE VALVE
	VENTURI
	CHECK VALVE
	2-WAY HYDRONIC CONTROL VALVE
	2-WAY DOMESTIC CONTROL VALVE
	3-WAY CONTROL VALVE
	DRAIN VALVE
	STRAINER
	MANUAL AIR VENT
	AUTO AIR VENT
	TEMPERATURE GAUGE
	PRESSURE GAUGE
	SENSOR
	FLOW METER
	UNION

PIPING LEGEND

——– – ——–	ABOVEGROUND WASTE
—UGW—	UNDERGROUND WASTE
——– – – ——–	VENT
—RC—	RAIN CONDUCTOR
—CW—	DOMESTIC COLD WATER
——– · ——–	DOMESTIC COLD WATER
—HW—	DOMESTIC HOT WATER
——– ·· ——–	DOMESTIC HOT WATER
—RHW—	RECIRC HOT WATER
——– ··· ——–	RECIRC HOT WATER
—140 HW—	HIGH TEMP HOT WATER
—ORC—	OVERFLOW RAIN CONDUCTOR
—HWS—	HOT WATER HTG SUPPLY
— –HWR– –	HOT WATER HTG RETURN
— –HWR– –	HOT WATER HTG RETURN
—HPS—	HEAT PUMP SUPPLY
—HPR—	HEAT PUMP RETURN
— –HPR– –	HEAT PUMP RETURN
—COND—	CONDENSATE DRAIN
—CTS—	CHILLED TOWER SUPPLY
—CTR—	CHILLED TOWER RETURN
—G—	NATURAL GAS

1 M302 — SECOND FLOOR PIPING PLAN
1/8" = 1'-0"

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CITY OF MINOT
MINOT CITY HALL RENOVATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET **M302**
2ND FLOOR PIPING

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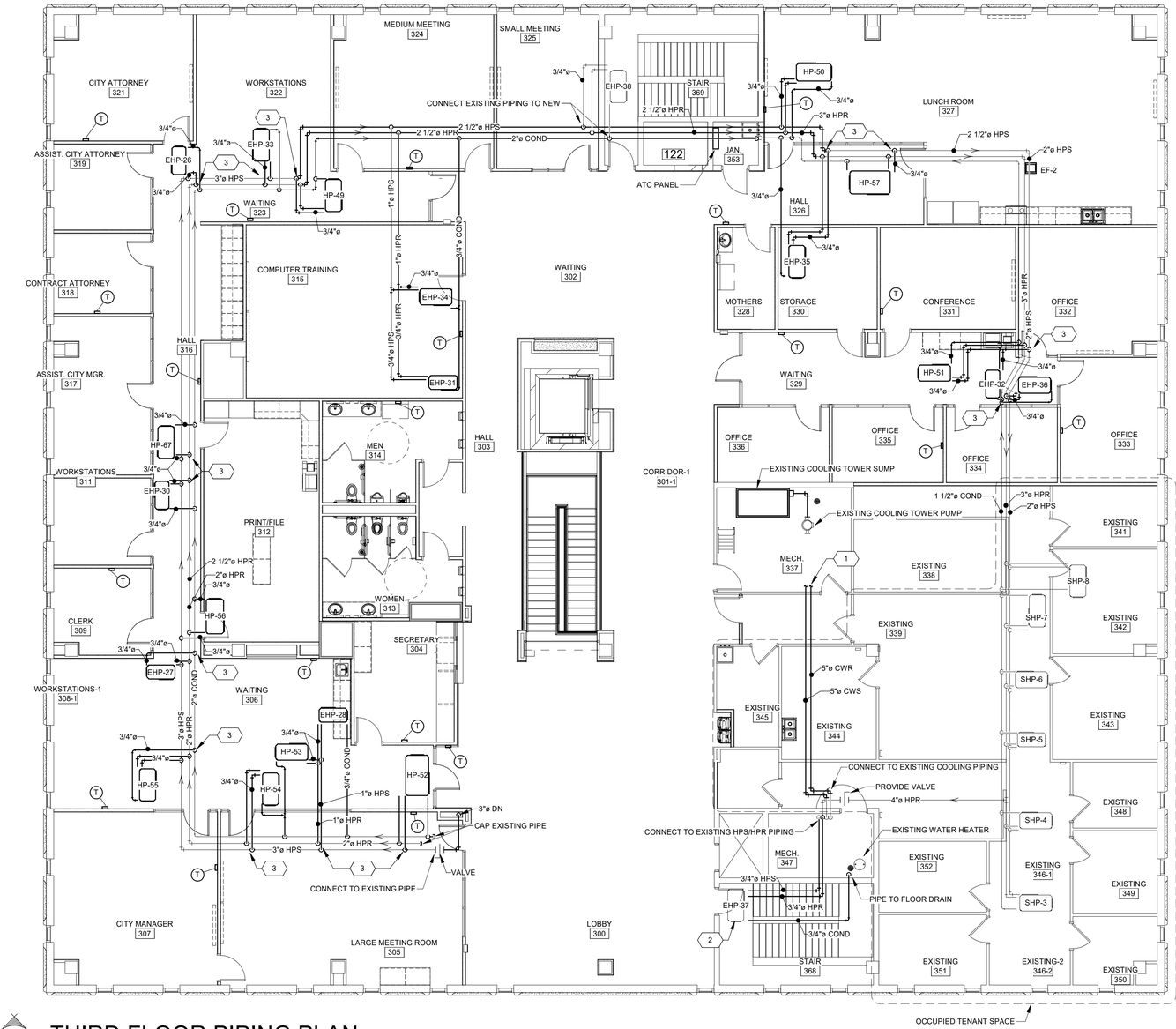

1 M303 THIRD FLOOR PIPING PLAN

1/8" = 1'-0"

LINE TYPE LEGEND	
	EXISTING
	NEW
	REMOVE
	HIDDEN
	MATCHLINE

PIPING VALVE & ACCESSORY LEGEND	
	BALL VALVE
	BALL VALVE INDICATOR
	BUTTERFLY VALVE
	GATE VALVE
	VENTURI
	CHECK VALVE
	2-WAY HYDRONIC CONTROL VALVE
	2-WAY DOMESTIC CONTROL VALVE
	3-WAY CONTROL VALVE
	DRAIN VALVE
	STRAINER
	MANUAL AIR VENT
	AUTO AIR VENT
	TEMPERATURE GAUGE
	PRESSURE GAUGE
	SENSOR
	FLOW METER
	UNION

PIPING LEGEND	
	ABOVEGROUND WASTE
UGW	UNDERGROUND WASTE
	VENT
RC	RAIN CONDUCTOR
CW	DOMESTIC COLD WATER
	DOMESTIC COLD WATER
HW	DOMESTIC HOT WATER
	DOMESTIC HOT WATER
RHW	RECIRC HOT WATER
	RECIRC HOT WATER
140 HW	HIGH TEMP HOT WATER
ORC	OVERFLOW RAIN CONDUCTOR
HWS	HOT WATER HTG SUPPLY
HWR	HOT WATER HTG RETURN
HWR	HOT WATER HTG RETURN
HPS	HEAT PUMP SUPPLY
HPR	HEAT PUMP RETURN
HPR	HEAT PUMP RETURN
COND	CONDENSATE DRAIN
CTS	CHILLED TOWER SUPPLY
CTR	CHILLED TOWER RETURN
G	NATURAL GAS

Keynote Legend	
1	CONNECT COOLING TOWER PIPING TO EXISTING PIPING IN MECH 337.
2	DISCONNECT AND REMOVE PIPING FROM HEAT PUMP. PREPARE HEAT PUMP FOR CONNECTION TO NEW PIPING AS REQUIRED.
3	CONNECT NEW HP PIPING TO EXISTING HPS/HPR/COND PIPING

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MINOT CITY HALL RENOVATION
MINOT, ND

CITY PROJECT 4466
DATE
11/04/21
PHASE
CONSTRUCTION DOCUMENTS
PROJECT
21019
SHEET
M303
3RD FLOOR PIPING

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PROJECT DESIGN CONDITIONS MINOT, NORTH DAKOTA					
	SUMMER			WINTER	
	DB	WB	DEW PT.	DB	
OUTDOOR	89°F	67°F	N/A	-22°F	
INDOOR	75°F	N/A	55°F	72°F	

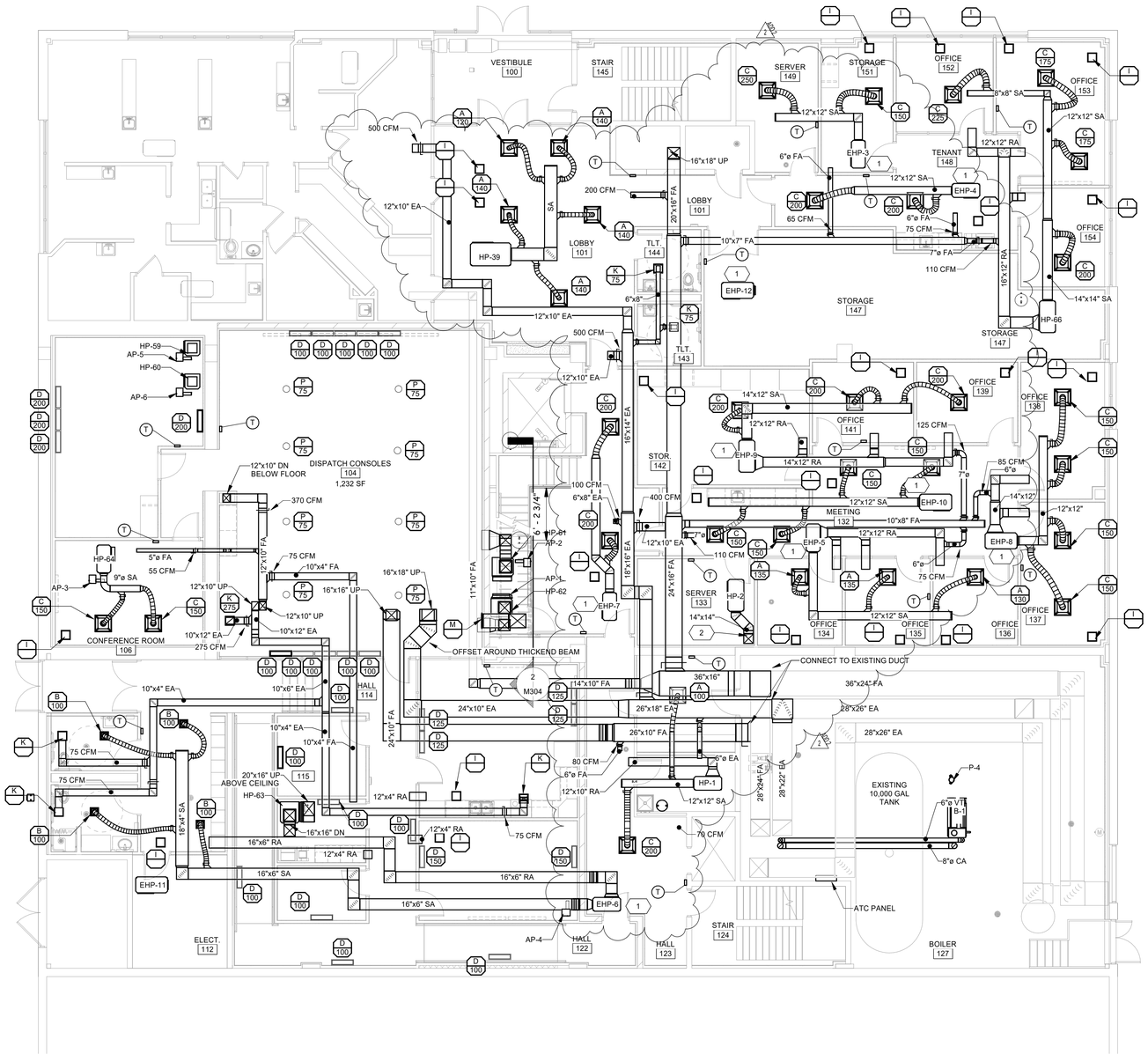
Keynote Legend	
1	HEAT PUMP TO BE REUSED FROM PREVIOUS PHASE.
2	INSTALL DUCT TO DISCHARGE 1' ABOVE FINISHED FLOOR

LINE TYPE LEGEND

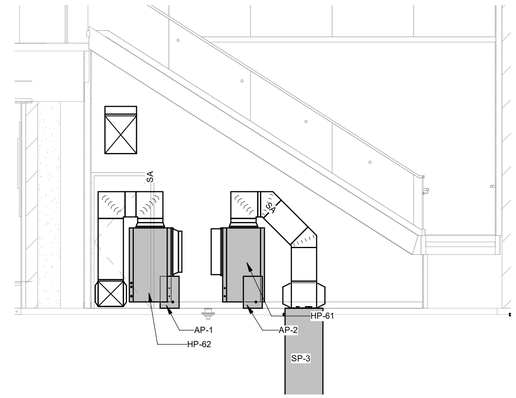
- EXISTING
- NEW
- REMOVE
- HIDDEN
- MATCHLINE

HVAC LEGEND

- POSITIVE PRESSURE DUCT
- NEGATIVE PRESSURE DUCT
- MANUAL DAMPER
- MOTORIZED DAMPER
- FIRE DAMPER
- COMB. SMOKE/FIRE DAMPER
- BACK DRAFT DAMPER
- ACCESS DOOR
- ELBOW WITH TURNING VANES
- HI-EFFICENCY TAKEOFF (W/ VOLUME DAMPER)
- FLEXIBLE DUCT
- AIR TERMINAL TAG
- AIR TERMINAL MARK
- AIR TERMINAL CFM
- AIR TERMINAL SIZE



1 M304 FIRST FLOOR HVAC PLAN
1/8" = 1'-0"



2 M304 PSAP HEAT PUMPS
1/4" = 1'-0"

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1	Addendum #1	11/12/21
2	Addendum #2	11/18/21

CITY OF MINOT
MINOT CITY HALL RENOVATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET M304
1ST FLOOR HVAC

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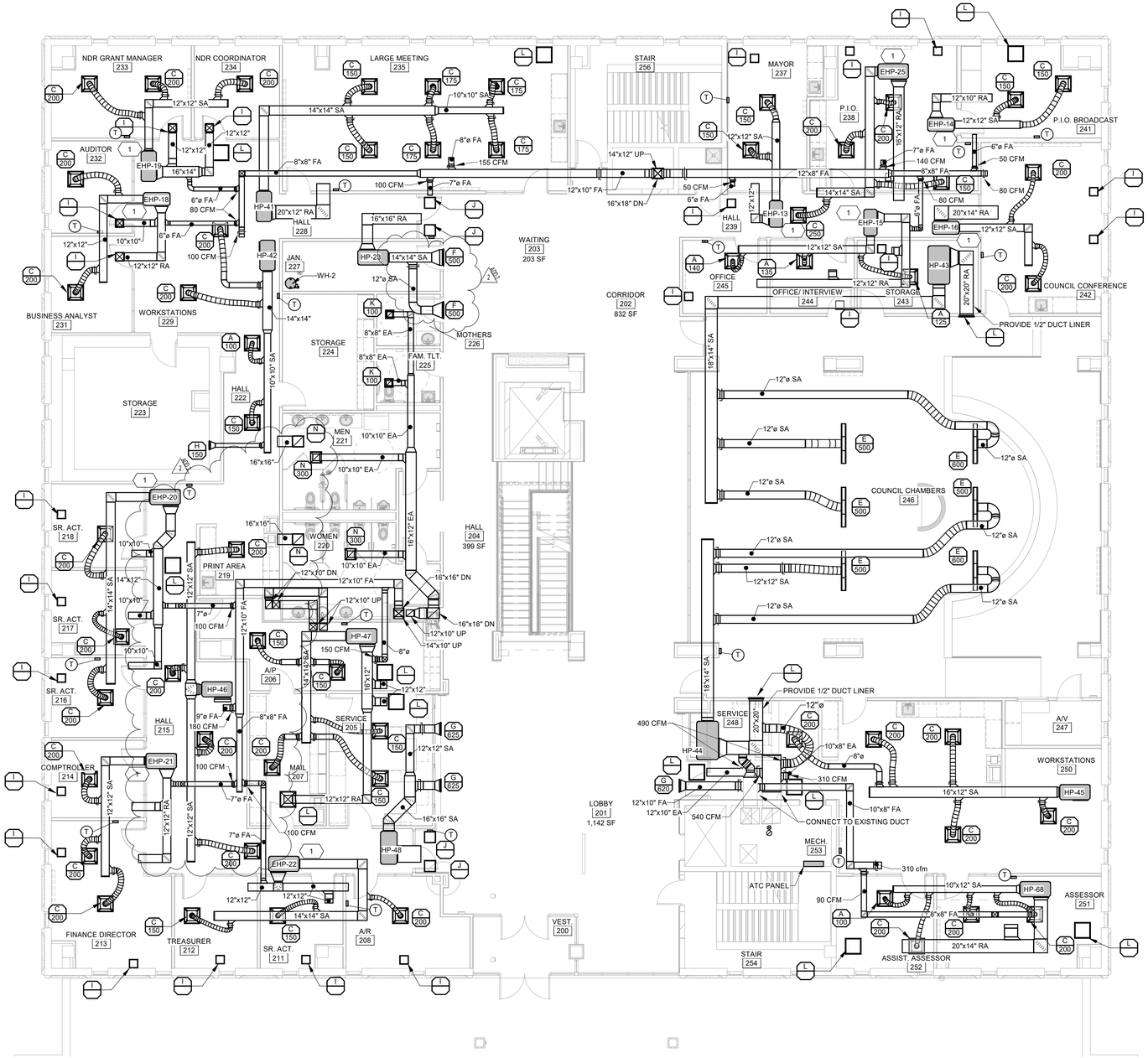

Keynote Legend	
1	HEAT PUMP TO BE REUSED FROM PREVIOUS PHASE.

LINE TYPE LEGEND

- EXISTING
- NEW
- REMOVE
- HIDDEN
- MATCHLINE

HVAC LEGEND

- POSITIVE PRESSURE DUCT
- NEGATIVE PRESSURE DUCT
- MANUAL DAMPER
- MOTORIZED DAMPER
- FIRE DAMPER
- COMB. SMOKE/FIRE DAMPER
- BACK DRAFT DAMPER
- ACCESS DOOR
- ELBOW WITH TURNING VANES
- HI-EFFICENCY TAKEOFF (W/ VOLUME DAMPER)
- FLEXIBLE DUCT

M 999 30"x30"

- AIR TERMINAL TAG
- AIR TERMINAL MARK
- AIR TERMINAL CFM
- AIR TERMINAL SIZE

SECOND FLOOR HVAC PLAN

1/8" = 1'-0"

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1	Addendum #1	11/12/21
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MINOT CITY HALL RENOVATION
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CITY PROJECT 4466
DATE 11/04/21
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PROJECT 21019
SHEET **M305**
2ND FLOOR HVAC

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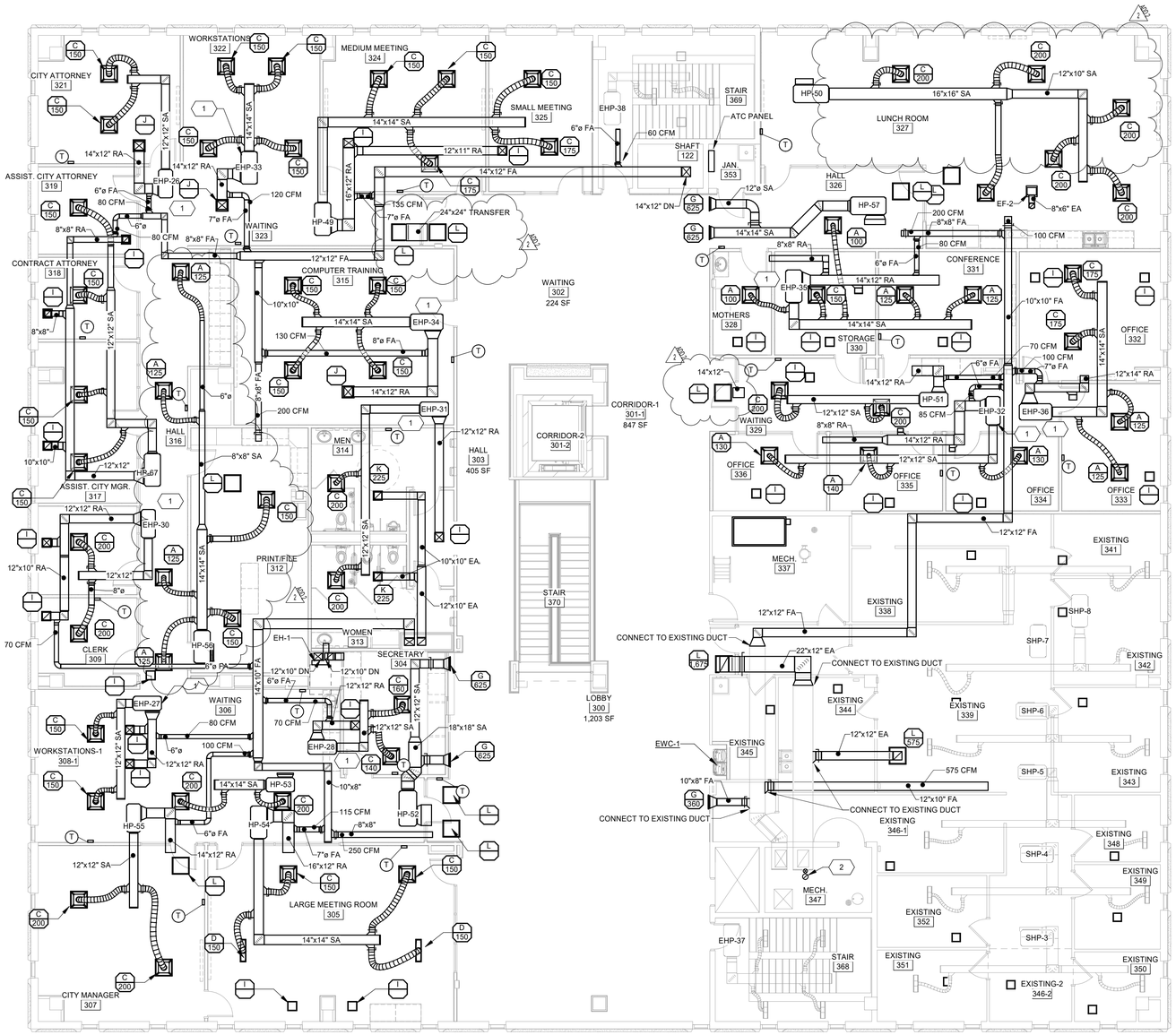

LINE TYPE LEGEND

- EXISTING
- NEW
- REMOVE
- HIDDEN
- MATCHLINE

HVAC LEGEND

- POSITIVE PRESSURE DUCT
- NEGATIVE PRESSURE DUCT
- MANUAL DAMPER
- MOTORIZED DAMPER
- FIRE DAMPER
- COMB. SMOKE/FIRE DAMPER
- BACK DRAFT DAMPER
- ACCESS DOOR
- ELBOW WITH TURNING VANES
- HI-EFFICENCY TAKEOFF (W/ VOLUME DAMPER)
- FLEXIBLE DUCT
- AIR TERMINAL TAG
- AIR TERMINAL MARK
- AIR TERMINAL CFM
- AIR TERMINAL SIZE

(M 999 30"x30")

Keynote Legend

1	HEAT PUMP TO BE REUSED FROM PREVIOUS PHASE.
2	6" BOILER VENTING AND 8" BOILER COMBUSTION AIR. PROVIDE TERMINATION PER MFR RECOMMENDATION

1 M306 THIRD FLOOR HVAC PLAN

1/8" = 1'-0"

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1	Addendum #1	11/12/21
2	Addendum #2	11/18/21

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MINOT CITY HALL RENOVATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET M306
3RD FLOOR HVAC

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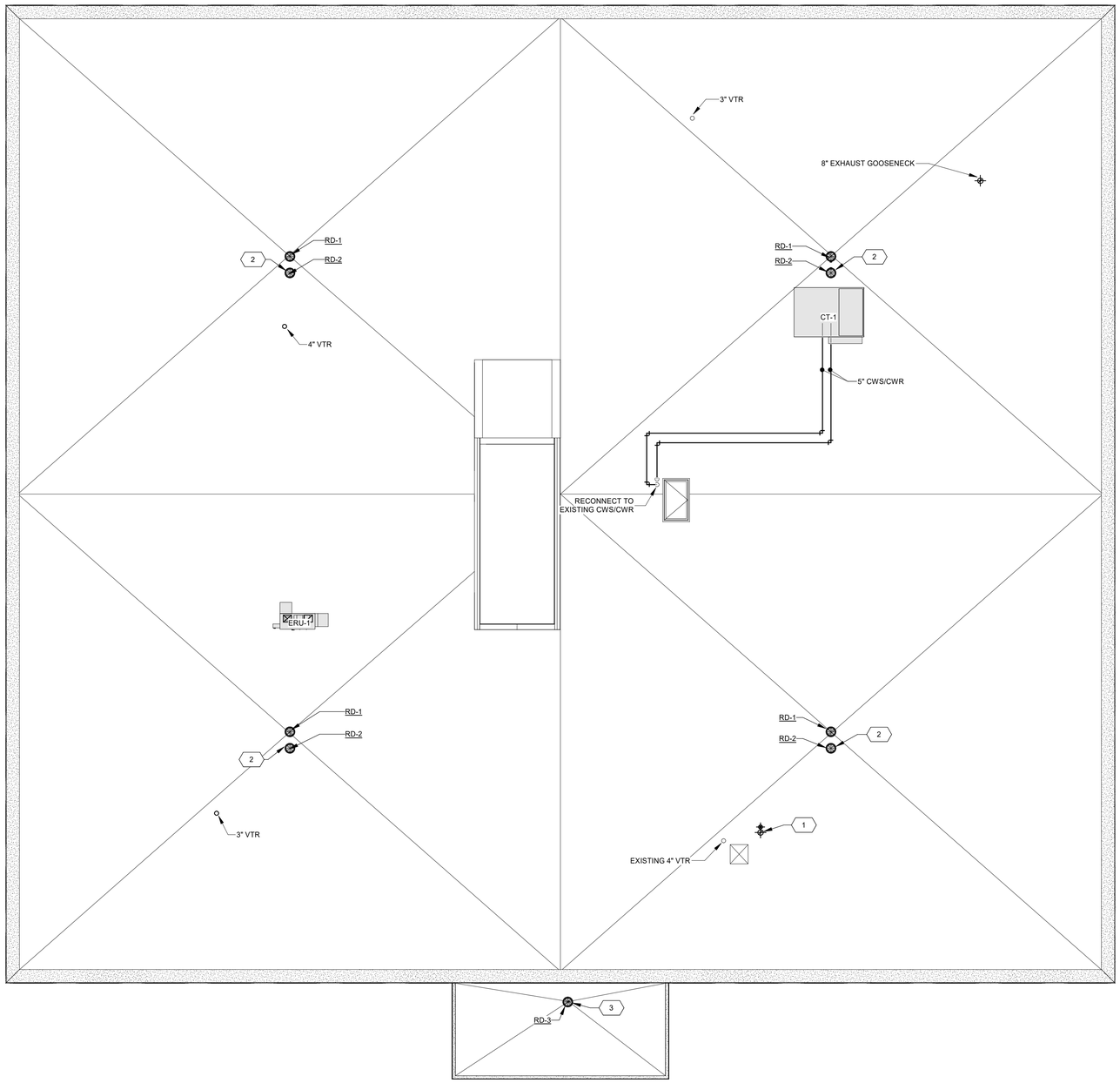

HVAC LEGEND

- POSITIVE PRESSURE DUCT
- NEGATIVE PRESSURE DUCT
- MANUAL DAMPER
- MOTORIZED DAMPER
- FIRE DAMPER
- COMB. SMOKE/FIRE DAMPER
- BACK DRAFT DAMPER
- ACCESS DOOR
- ELBOW WITH TURNING VANES
- HI-EFFICENCY TAKEOFF (W/ VOLUME DAMPER)
- FLEXIBLE DUCT

M 998 30"x30"

- AIR TERMINAL TAG
- AIR TERMINAL MARK
- AIR TERMINAL CFM
- AIR TERMINAL SIZE

PIPING LEGEND

——– ——–	ABOVEGROUND WASTE
——UGW——	UNDERGROUND WASTE
—— – – ——	VENT
——RC——	RAIN CONDUCTOR
——CW——	DOMESTIC COLD WATER
——·——	DOMESTIC COLD WATER
——HW——	DOMESTIC HOT WATER
——··——	DOMESTIC HOT WATER
——RHW——	RECIRC HOT WATER
——···——	RECIRC HOT WATER
—140 HW——	HIGH TEMP HOT WATER
——ORC——	OVERFLOW RAIN CONDUCTOR
——HWS——	HOT WATER HTG SUPPLY
— –HWR— –	HOT WATER HTG RETURN
— –HWR— –	HOT WATER HTG RETURN
——HPS——	HEAT PUMP SUPPLY
——HPR——	HEAT PUMP RETURN
— –HPR— –	HEAT PUMP RETURN
——COND——	CONDENSATE DRAIN
——CTS——	CHILLED TOWER SUPPLY
——CTR——	CHILLED TOWER RETURN
——G——	NATURAL GAS

Keynote Legend

1	6" BOILER VENTING AND 8" BOILER COMBUSTION AIR. PROVIDE TERMINATION PER MFR RECOMMENDATION
2	PROVIDE PRIMARY ROOF DRAIN AND OVERFLOW ROOF DRAIN UNDER ROOFING ALTERNATE 12
3	EXISTING ROOF DRAIN TO REMAIN UNDER BASE BID. REMOVE UNDER ROOFING ALTERNATE 12.

2 M307 ROOF PLAN
1/8" = 1'-0"

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21019
SHEET
M307
ROOF MECHANICAL PLAN

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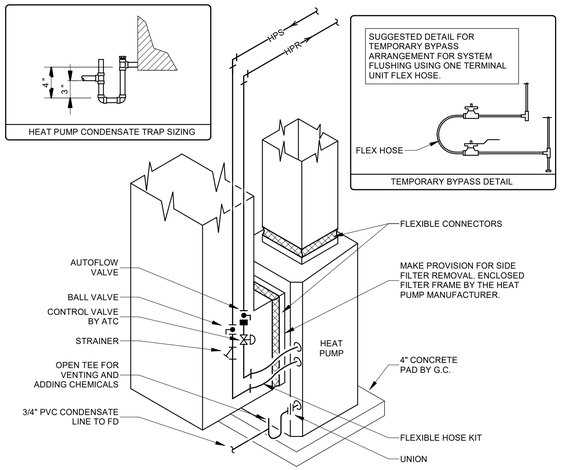
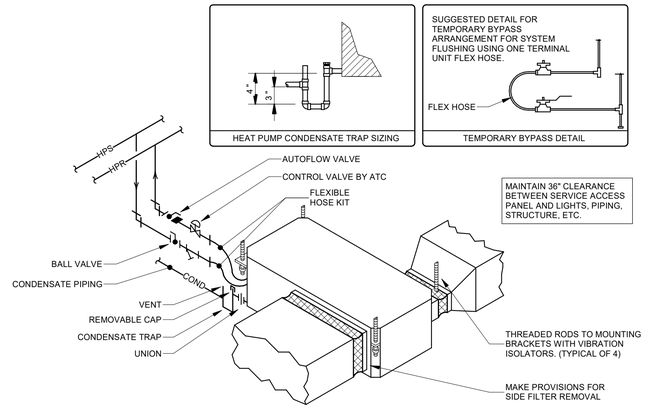


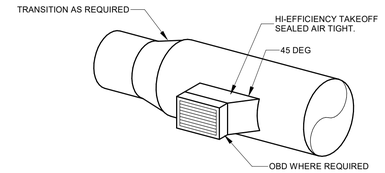
1 M401 NTS

VERTICAL HEAT PUMP DETAIL



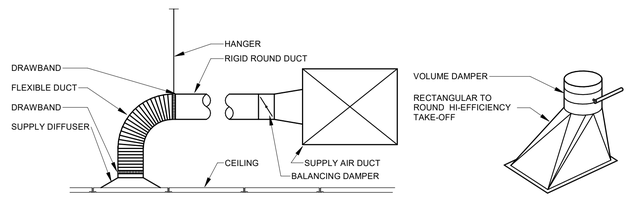
2 M401 NTS

HORIZONTAL HEAT PUMP DETAIL



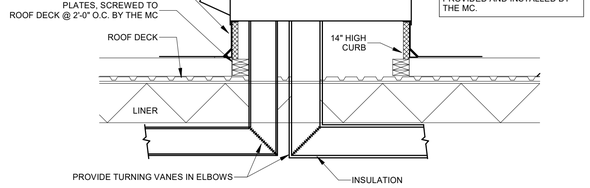
4 M401 NTS

TYPICAL DUCT MOUNTED GRILLE



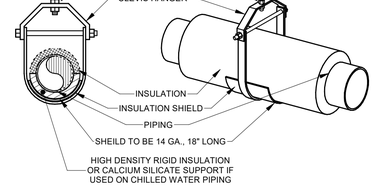
5 M401 NTS

TYPICAL DIFFUSER CONNECTIONS



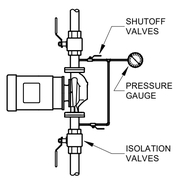
6 M401 NTS

ENERGY RECOVERY UNIT DETAIL



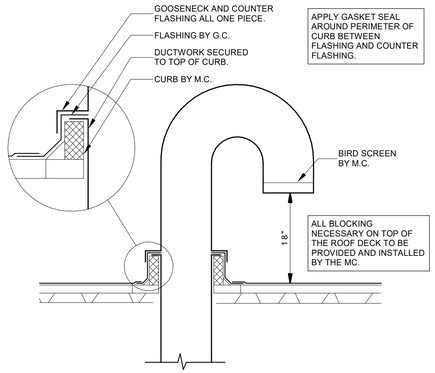
7 M401 NTS

PIPE HANGER DETAIL



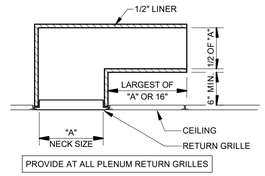
3 M401 NTS

INLINE PUMP DETAIL



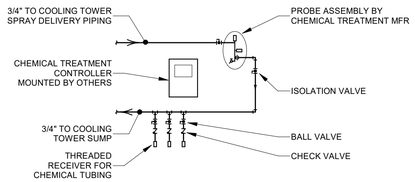
8 M401 NTS

GOOSENECK DETAIL



9 M401 NTS

TYPICAL SOUND BOOT



10 M401 NTS

CHEMICAL TREATMENT MANIFOLD SCHEMATIC

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MINOT CITY HALL RENOVATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21019
SHEET M401
MECHANICAL DETAILS

238000 - HEAT PUMP - WATER-TO-AIR

SCHEDULE NOTES:
1. PROVIDE HOSE KIT WITH Y-TYPE STRAINER, AUTO-BALANCE VALVE, AND ISOLATION VALVES. SEE SPECIFICATION.
2. NO EQUAL SHALL BE CONSIDERED IF ANY OF THE SCHEDULED VALUES ARE +/- 5% FROM VALUE SCHEDULED. ALL ELECTRICAL CHANGES CAUSED BY DIFFERING MFR WILL BE PAID FOR BY THE M.C.
3. RELOCATED HEAT PUMP

MARK	MANUFACTURER	MODEL	SIZE	CONNECTION SIZE	AIR SIDE		WATER SIDE			COOLING				HEATING			ELECTRICAL					NOTES
					FLOW	ESP	FLUID	FLOW	PD	OUTPUT	EER	EWT	LWT	OUTPUT	COP	EWT	MCA	MOP	VOLT	Ph	Hz	
EHP-3	MCQUAY	012	012	1/2"	400 CFM	0.38 in-wg	WATER	2.4 GPM	6 ftH2O	14,000 Btu/h	15.5	77 °F	87 °F	14,800 Btu/h	3.95	60 °F	10 A	20 A	277 V	1	60 Hz	1, 3
EHP-4	MCQUAY	012	012	1/2"	400 CFM	0.38 in-wg	WATER	2.4 GPM	6 ftH2O	14,000 Btu/h	15.5	77 °F	87 °F	14,800 Btu/h	3.95	60 °F	10 A	20 A	277 V	1	60 Hz	1, 3
EHP-5	MCQUAY	012	012	1/2"	400 CFM	0.38 in-wg	WATER	2.4 GPM	6 ftH2O	14,000 Btu/h	15.5	77 °F	87 °F	14,800 Btu/h	3.95	60 °F	10 A	20 A	277 V	1	60 Hz	1, 3
EHP-6	MCQUAY	012	012	1/2"	400 CFM	0.38 in-wg	WATER	2.4 GPM	6 ftH2O	14,000 Btu/h	15.5	77 °F	87 °F	14,800 Btu/h	3.95	60 °F	10 A	20 A	277 V	1	60 Hz	1, 3
EHP-7	MCQUAY	012	012	1/2"	400 CFM	0.38 in-wg	WATER	2.4 GPM	6 ftH2O	14,000 Btu/h	15.5	77 °F	87 °F	14,800 Btu/h	3.95	60 °F	10 A	20 A	277 V	1	60 Hz	1, 3
EHP-8	MCQUAY	019	018	3/4"	600 CFM	0.38 in-wg	WATER	4 GPM	6 ftH2O	20,700 Btu/h	15.7	77 °F	87 °F	22,000 Btu/h	4.4	60 °F	12 A	15 A	277 V	1	60 Hz	1, 3
EHP-9	MCQUAY	019	018	3/4"	600 CFM	0.38 in-wg	WATER	4 GPM	6 ftH2O	20,700 Btu/h	15.7	77 °F	87 °F	22,000 Btu/h	4.4	60 °F	12 A	15 A	277 V	1	60 Hz	1, 3
EHP-10	MCQUAY	019	018	3/4"	600 CFM	0.38 in-wg	WATER	4 GPM	6 ftH2O	20,700 Btu/h	15.7	77 °F	87 °F	22,000 Btu/h	4.4	60 °F	12 A	15 A	277 V	1	60 Hz	1, 3
EHP-11	MCQUAY	019	018	3/4"	600 CFM	0.38 in-wg	WATER	4 GPM	6 ftH2O	20,700 Btu/h	15.7	77 °F	87 °F	22,000 Btu/h	4.4	60 °F	12 A	15 A	277 V	1	60 Hz	1, 3
EHP-12	MCQUAY	024	024	3/4"	800 CFM	0.38 in-wg	WATER	5 GPM	8 ftH2O	26,900 Btu/h	16.9	77 °F	87 °F	26,900 Btu/h	4.2	60 °F	13 A	20 A	277 V	1	60 Hz	1, 3
EHP-13	MCQUAY	009	009	1/2"	300 CFM	0.38 in-wg	WATER	2 GPM	6 ftH2O	11,600 Btu/h	15.6	70 °F	90 °F	11,400 Btu/h	0	60 °F	5 A	15 A	277 V	1	60 Hz	1, 3
EHP-14	MCQUAY	009	009	1/2"	300 CFM	0.38 in-wg	WATER	2 GPM	6 ftH2O	11,600 Btu/h	15.6	70 °F	90 °F	11,400 Btu/h	0	60 °F	5 A	15 A	277 V	1	60 Hz	1, 3
EHP-15	MCQUAY	012	012	1/2"	400 CFM	0.38 in-wg	WATER	2.4 GPM	6 ftH2O	14,000 Btu/h	15.5	77 °F	87 °F	14,800 Btu/h	3.95	60 °F	10 A	20 A	277 V	1	60 Hz	1, 3
EHP-16	MCQUAY	012	012	1/2"	400 CFM	0.38 in-wg	WATER	2.4 GPM	6 ftH2O	14,000 Btu/h	15.5	77 °F	87 °F	14,800 Btu/h	3.95	60 °F	10 A	20 A	277 V	1	60 Hz	1, 3
EHP-18	MCQUAY	012	012	1/2"	400 CFM	0.38 in-wg	WATER	2.4 GPM	6 ftH2O	14,000 Btu/h	15.5	77 °F	87 °F	14,800 Btu/h	3.95	60 °F	10 A	20 A	277 V	1	60 Hz	1, 3
EHP-19	MCQUAY	019	018	3/4"	600 CFM	0.38 in-wg	WATER	4 GPM	6 ftH2O	20,700 Btu/h	15.7	77 °F	87 °F	22,000 Btu/h	4.4	60 °F	12 A	15 A	277 V	1	60 Hz	1, 3
EHP-20	MCQUAY	019	018	3/4"	600 CFM	0.38 in-wg	WATER	4 GPM	6 ftH2O	20,700 Btu/h	15.7	77 °F	87 °F	22,000 Btu/h	4.4	60 °F	12 A	15 A	277 V	1	60 Hz	1, 3
EHP-21	MCQUAY	019	018	3/4"	600 CFM	0.38 in-wg	WATER	4 GPM	6 ftH2O	20,700 Btu/h	15.7	77 °F	87 °F	22,000 Btu/h	4.4	60 °F	12 A	15 A	277 V	1	60 Hz	1, 3
EHP-22	MCQUAY	019	018	3/4"	600 CFM	0.38 in-wg	WATER	4 GPM	6 ftH2O	20,700 Btu/h	15.7	77 °F	87 °F	22,000 Btu/h	4.4	60 °F	12 A	15 A	277 V	1	60 Hz	1, 3
EHP-25	MCQUAY	024	024	3/4"	800 CFM	0.38 in-wg	WATER	5 GPM	8 ftH2O	26,900 Btu/h	16.9	77 °F	87 °F	26,900 Btu/h	4.2	60 °F	13 A	20 A	277 V	1	60 Hz	1, 3
EHP-26	MCQUAY	009	009	1/2"	300 CFM	0.38 in-wg	WATER	2 GPM	6 ftH2O	11,600 Btu/h	15.6	70 °F	90 °F	11,400 Btu/h	0	60 °F	5 A	15 A	277 V	1	60 Hz	1, 3
EHP-27	MCQUAY	009	009	1/2"	300 CFM	0.38 in-wg	WATER	2 GPM	6 ftH2O	11,600 Btu/h	15.6	70 °F	90 °F	11,400 Btu/h	0	60 °F	5 A	15 A	277 V	1	60 Hz	1, 3
EHP-28	MCQUAY	009	009	1/2"	300 CFM	0.38 in-wg	WATER	2 GPM	6 ftH2O	11,600 Btu/h	15.6	70 °F	90 °F	11,400 Btu/h	0	60 °F	5 A	15 A	277 V	1	60 Hz	1, 3
EHP-30	MCQUAY	012	012	1/2"	400 CFM	0.38 in-wg	WATER	2.4 GPM	6 ftH2O	14,000 Btu/h	15.5	77 °F	87 °F	14,800 Btu/h	3.95	60 °F	10 A	20 A	277 V	1	60 Hz	1, 3
EHP-31	MCQUAY	012	012	1/2"	400 CFM	0.38 in-wg	WATER	2.4 GPM	6 ftH2O	14,000 Btu/h	15.5	77 °F	87 °F	14,800 Btu/h	3.95	60 °F	10 A	20 A	277 V	1	60 Hz	1, 3
EHP-32	MCQUAY	012	012	1/2"	400 CFM	0.38 in-wg	WATER	2.4 GPM	6 ftH2O	14,000 Btu/h	15.5	77 °F	87 °F	14,800 Btu/h	3.95	60 °F	10 A	20 A	277 V	1	60 Hz	1, 3
EHP-33	MCQUAY	019	018	3/4"	600 CFM	0.38 in-wg	WATER	4 GPM	6 ftH2O	20,700 Btu/h	15.7	77 °F	87 °F	22,000 Btu/h	4.4	60 °F	12 A	15 A	277 V	1	60 Hz	1, 3
EHP-34	MCQUAY	019	018	3/4"	600 CFM	0.38 in-wg	WATER	4 GPM	6 ftH2O	20,700 Btu/h	15.7	77 °F	87 °F	22,000 Btu/h	4.4	60 °F	12 A	15 A	277 V	1	60 Hz	1, 3
EHP-35	MCQUAY	019	018	3/4"	600 CFM	0.38 in-wg	WATER	4 GPM	6 ftH2O	20,700 Btu/h	15.7	77 °F	87 °F	22,000 Btu/h	4.4	60 °F	12 A	15 A	277 V	1	60 Hz	1, 3
EHP-36	MCQUAY	019	018	3/4"	600 CFM	0.38 in-wg	WATER	4 GPM	6 ftH2O	20,700 Btu/h	15.7	77 °F	87 °F	22,000 Btu/h	4.4	60 °F	12 A	15 A	277 V	1	60 Hz	1, 3
HP-1	DAIKIN	009	009	1/2"	300 CFM	0.38 in-wg	WATER	2.4 GPM	6 ftH2O	11,600 Btu/h	15.6	77 °F	87 °F	11,600 Btu/h	5	60 °F	5 A	15 A	277 V	1	60 Hz	1, 2
HP-2	DAIKIN	024	024	3/4"	800 CFM	0.38 in-wg	WATER	6 GPM	6 ftH2O	26,900 Btu/h	16.9	77 °F	87 °F	26,500 Btu/h	5	60 °F	13 A	20 A	277 V	1	60 Hz	1, 2
HP-23	DAIKIN	030	030	3/4"	1,000 CFM	0.38 in-wg	WATER	7.5 GPM	6 ftH2O	30,200 Btu/h	17.3	77 °F	87 °F	31,500 Btu/h	4.9	60 °F	18 A	25 A	277 V	1	60 Hz	1, 2
HP-39	DAIKIN	048	048	1"	1,600 CFM	0.38 in-wg	WATER	12 GPM	7 ftH2O	47,400 Btu/h	17.2	77 °F	87 °F	54,000 Btu/h	4.6	60 °F	13 A	20 A	460 V	3	60 Hz	1, 2
HP-41	DAIKIN	030	030	3/4"	1,000 CFM	0.38 in-wg	WATER	7.5 GPM	6 ftH2O	30,200 Btu/h	17.3	77 °F	87 °F	31,500 Btu/h	4.9	60 °F	18 A	25 A	277 V	1	60 Hz	1, 2
HP-42	DAIKIN	024	024	3/4"	800 CFM	0.38 in-wg	WATER	6 GPM	6 ftH2O	26,900 Btu/h	16.9	77 °F	87 °F	26,500 Btu/h	5	60 °F	13 A	20 A	277 V	1	60 Hz	1, 2
HP-43	DAIKIN	048	048	1"	1,600 CFM	0.38 in-wg	WATER	12 GPM	7 ftH2O	47,400 Btu/h	17.2	77 °F	87 °F	54,000 Btu/h	4.6	60 °F	13 A	20 A	460 V	3	60 Hz	1, 2
HP-44	DAIKIN	048	048	1"	1,600 CFM	0.38 in-wg	WATER	12 GPM	7 ftH2O	47,400 Btu/h	17.2	77 °F	87 °F	54,000 Btu/h	4.6	60 °F	13 A	20 A	460 V	3	60 Hz	1, 2
HP-45	DAIKIN	030	030	3/4"	1,000 CFM	0.38 in-wg	WATER	7.5 GPM	6 ftH2O	30,200 Btu/h	17.3	77 °F	87 °F	31,500 Btu/h	4.9	60 °F	18 A	25 A	277 V	1	60 Hz	1, 2
HP-46	DAIKIN	019	018	3/4"	600 CFM	0.38 in-wg	WATER	4.4 GPM	6 ftH2O	20,700 Btu/h	15.7	77 °F	87 °F	20,800 Btu/h	5	60 °F	12 A	15 A	277 V	1	60 Hz	1, 2
HP-47	DAIKIN	024	024	3/4"	800 CFM	0.38 in-wg	WATER	6 GPM	6 ftH2O	26,900 Btu/h	16.9	77 °F	87 °F	26,500 Btu/h	5	60 °F	13 A	20 A	277 V	1	60 Hz	1, 2
HP-48	DAIKIN	036	036	3/4"	1,250 CFM	0.38 in-wg	WATER	9 GPM	9 ftH2O	31,900 Btu/h	19.2	77 °F	87 °F	38,800 Btu/h	5.1	60 °F	11 A	15 A	460 V	3	60 Hz	1, 2
HP-49	DAIKIN	024	024	3/4"	800 CFM	0.38 in-wg	WATER	6 GPM	6 ftH2O	26,900 Btu/h	16.9	77 °F	87 °F	26,500 Btu/h	5	60 °F	13 A	20 A	277 V	1	60 Hz	1, 2
HP-50	DAIKIN	036	036	3/4"	1,250 CFM	0.38 in-wg	WATER	9 GPM	9 ftH2O	31,900 Btu/h	19.2	77 °F	87 °F	38,800 Btu/h	5.1	60 °F	11 A	15 A	460 V	3	60 Hz	1, 2
HP-51	DAIKIN	012	012	1/2"	400 CFM	0.38 in-wg	WATER	1.8 GPM	6 ftH2O	7,800 Btu/h	15.5	90 °F	102 °F	6,200 Btu/h	0	43 °F	6 A	15 A	277 V	1	60 Hz	1, 2
HP-52	DAIKIN	036	036	3/4"	1,250 CFM	0.38 in-wg	WATER	9 GPM	9 ftH2O	31,900 Btu/h	19.2	77 °F	87 °F	38,800 Btu/h	5.1	60 °F	11 A	15 A	460 V	3	60 Hz	1, 2
HP-53	DAIKIN	012	012	1/2"	400 CFM	0.38 in-wg	WATER	1.8 GPM	6 ftH2O	7,800 Btu/h	15.5	90 °F	102 °F	6,200 Btu/h	0	43 °F	6 A	15 A	277 V	1	60 Hz	1, 2
HP-54	DAIKIN	019	018	3/4"	600 CFM	0.38 in-wg	WATER	4.4 GPM	6 ftH2O	20,700 Btu/h	15.7	77 °F	87 °F	20,800 Btu/h	5	60 °F	12 A	15 A	277 V	1	60 Hz	1, 2
HP-55	DAIKIN	012	012	1/2"	400 CFM	0.38 in-wg	WATER	1.8 GPM	6 ftH2O	7,800 Btu/h	15.5	90 °F	102 °F	6,200 Btu/h	0	43 °F	6 A	15 A	277 V	1	60 Hz	1, 2
HP-56	DAIKIN	024	024	3/4"	800 CFM	0.38 in-wg	WATER	6 GPM	6 ftH2O	26,900 Btu/h	16.9	77 °F	87 °F	26,500 Btu/h	5	60 °F	13 A	20 A	277 V	1	60 Hz	1, 2
HP-57	DAIKIN	036	036	3/4"	1,250 CFM	0.38 in-wg	WATER	9 GPM	9 ftH2O	31,900 Btu/h	19.2	77 °F	87 °F	38,800 Btu/h	5.1	60 °F	11 A	15 A	460 V	3	60 Hz	1, 2
HP-59	DAIKIN	GEVE024	024	3/4"	800 CFM	0.00 in-wg	WATER	6 GPM	6 ftH2O	26,900 Btu/h	17	77 °F	87 °F	26,500 Btu/h	5	60 °F	14 A	20 A	277 V	1	60 Hz	1, 2
HP-60	DAIKIN	GEVE024	024	3/4"	800 CFM	0.00 in-wg	WATER	6 GPM	6 ftH2O	26,900 Btu/h	17	77 °F	87 °F	26,500 Btu/h	5	60 °F	14 A	20 A	277 V	1	60 Hz	1, 2
HP-61	DAIKIN	GEVE048	048	3/4"	1,600 CFM	0.00 in-wg	WATER	12 GPM	7 ftH2O	47,400 Btu/h	16.2	77 °F	87 °F	54,000 Btu/h	4.6	60 °F	13 A	20 A	460 V	3	60 Hz	1, 2
HP-62	DAIKIN	GEVE048	048	3/4"	1,600 CFM	0.00 in-wg	WATER	12 GPM	7 ftH2O	47,400 Btu/h	16.2	77 °F	87 °F	54,000 Btu/h	4.6	60 °F	13 A	20 A	460 V	3	60 Hz	1, 2
HP-63	DAIKIN	GEVE048	048	3/4"	1,600 CFM	0.00 in-wg	WATER	12 GPM	7 ftH2O	47,400 Btu/h	16.2	77 °F	87 °F	54,000 Btu/h	4.6	60 °F	13 A	20 A	460 V	3	60 Hz	1, 2
HP-64	DAIKIN	009	009	1/2"	300 CFM	0.38 in-wg	WATER	2.4 GPM	6 ftH2O	11,600 Btu/h	15.6	77 °F	87 °F	11,600 Btu/h	5	60 °F	5 A	15 A	277 V	1	60 Hz	1, 2
HP-66	DAIKIN	024	024	3/4"	800 CFM	0.38 in-wg	WATER	6 GPM	6 ftH2O	26,900 Btu/h	16.9	77 °F	87 °F	26,500 Btu/h	5	60 °F	13 A	20 A	277 V	1	60 Hz	1, 2
HP-67	DAIKIN	019	018	3/4"	600 CFM	0.38 in-wg	WATER	4.4 GPM	6 ftH2O	20,700 Btu/h	15.7	77 °F	87 °F	20,800 Btu/h	5	60 °F	12 A	15 A	277 V	1	60 Hz	1, 2
HP-68	DAIKIN	019	018	3/4"	600 CFM	0.38 in-wg	WATER	4.4 GPM	6 ftH2O	20,700 Btu/h	15.7	77 °F	87 °F	20,800 Btu/h	5	60 °F	12 A	15 A	277 V	1	60 Hz	1, 2

235000 - GAS BOILER SCHEDULE

SCHEDULE NOTES:
1. MOUNT ON 4" CONCRETE HOUSEKEEPING PAD
2. PROVIDE TESTABLE LWCO, FLOW SWITCH, COMBINATION PRESSURE/TEMP GAUGE, 50# ASME RELIEF VALVE
3. BOILER CONTROLER SHALL HAVE CAPACITY TO OPERATE BOILER PUMP AND PROVIDE FOR CONNECTION TO BAS

MARK	MANUFACTURER	MODEL	TYPE	FUEL	GAS PRESSURE	INPUT	OUTPUT	TURNDOWN	DESIGN FLOW	ELECTRICAL			NOTES
										VOLT	Ph	Hz	
B-1	HYDROTHERM	KN-16	CAST IRON CONDENSING	NG	2 psi	1,600,000 Btu/h	1,440,000 Btu/h	10:1	72 GPM	480 V	3	60 Hz	1, 2, 3

236000 - ALTERNATE COOLING TOWER

SCHEDULE NOTES:
1. UNDER ALTERNATE BID
2. NOT USED

MARK	MANUFACTURER	PRODUCT LINE	MODEL	HEAT REJECTION	OPERATING WEIGHT	AIR SIDE				WATER SIDE				ELECTRICAL			NOTES
						AMBIENT WB	AIR FLOW	FAN MOTOR	FAN QTY	FLUID	FLUID FLOW	EWT	LWT	VOLTS	Ph	Hz	
CT-1	Baltimore Aircoil Company	FXT	FXT-115	1,845,561 Btu/h	6080 lb	72 °F	33,900 CFM	5 hp	1	WATER	370 GPM	91 °F	81 °F	480 V	3	60 Hz	1

233700 - AIR TERMINAL SCHEDULE

SCHEDULE NOTES:
1. M.C. TO PROVIDE SHEET METAL TRASITION FROM DUCT TO GRILLE AS REQUIRED.
2. PLAQUE TYPE DIFFUSER
3. CONE TYPE DIFFUSER
4. LONG BLADE
5. SHORT BLADE
6. PROVIDE DAMPER
7. FILTER GRILLE, FOR 2 INCH FILTERS
8. ROUND DIFFUSER
9. PAINT BLACK INSIDE DUCT SURFACE ABOVE REGISTER
10. RECTANGUALR/SQUARE DIFFUSER/GRILLE
11. HEAVY DUTY
12. 45 DEGREE BLADES ANGLED UP
13. EGG CRATE GRILLE
14. 24"X24" FACE
15. SINGLE DEFLECTION
16. DOUBLE DEFLECTION
17. 2" SLOT DIFFUSER, PROVIDE PLENUM, 5' LENGTH
18. NOT USED
19. ACCESS FLOOR SHORT THROW HIGH INDUCTION SUPPLY DIFFUSER

*CONTRACTOR TO VERIFY CEILING TYPES AND QUANTITIES PRIOR TO ORDERING

TAG	QTY	MANUFACTURER	MODEL	FUNCTION	SIZE	FINISH	FRAME	MOUNT	NOTES
A	48	TITUS HVAC	OMNI	Supply Air	6"ø	B12	TYPE 31	LAY-IN-TILE	2, 10, 14
B	4	TITUS HVAC	OMNI	Supply Air	6"ø	B12	TYPE 31	SURFACE	2, 10, 14
C	120	TITUS HVAC	OMNI	Supply Air	8"ø	B12	TYPE 31	LAY-IN-TILE	2, 10, 14
D	30	TITUS HVAC	272RL	Supply Air	30"x6"	WHITE	TYPE 1000	SURFACE	1, 4, 10, 16
E	6	TITUS HVAC	FL-20	Supply Air	12"ø	B12	TYPE 14	LAY-IN-TILE	10, 17
F	2	TITUS HVAC	272RL	Supply Air	24"x10"	WHITE	TYPE F	SURFACE	1, 4, 10, 16
G	8	TITUS HVAC	272RL	Supply Air	18"x12"	WHITE	TYPE F	SURFACE	1, 4, 10, 16
H	1	TITUS HVAC	272RL	Supply Air	12"x12"	WHITE	TYPE F	SURFACE	1, 4, 10, 16
I	83	TITUS HVAC	50R	Return Air	12"x12"	WHITE	TYPE F	SURFACE	1, 10, 13
J	7	TITUS HVAC	50R	Return Air	16"x16"	WHITE	TYPE F	SURFACE	1, 10, 13
K	10	TITUS HVAC	50R	Exhaust Air	12"x12"	WHITE	TYPE F	SURFACE	1, 6, 10, 13
L	24	TITUS HVAC	50R	Return Air	22"x22"	WHITE	TYPE F	LAY-IN-TILE	1, 10, 13
M	1	TITUS HVAC	25RL	Return Air	20"x24"	WHITE	TYPE F	SURFACE	1, 4, 10, 15
N	4	TITUS HVAC	50R	Exhaust Air	16"x16"	WHITE	TYPE F	SURFACE	1, 6, 10, 13
P	8	Titus	TAF-R	Supply Air	8"ø	BLACK	FLANGE	FLOOR	6, 8, 19

232200 - PUMP SCHEDULE

SCHEDULE NOTES:
1. PROVIDE SINGLE SPEED MOTOR
2. PROVIDE CHECK VALVE ON DISCHARGE
3. PROVIDE TIMER AND AQUA-STAT
4. PROVIDE 5' CORD AND PLUG

MARK	MANUFACTURER	MODEL	TYPE	GPM	FT of HD	MOTOR INFORMATION					NOTES
						BHP	HP	VOLTS	Ph	Hz	
CIRC-1	Bell & Gossett	NRF-22	INLINE	5 GPM	12 ftH2O		0.12 hp	120 V	1	60 Hz	1, 3, 4
CP-1	LITTLE GIANT	VCMA-15UL	CONDENSATE	0.2 GPM	12 ftH2O	0.02 hp	0.02 hp	115 V	1	60 Hz	1, 2, 3, 4
RP-2	Bell & Gossett	NRF-22	INLINE	5 GPM	12 ftH2O		0.12 hp	120 V	1	60 Hz	1, 3, 4

235700 - AIR-TO-AIR HEAT RECOVERY UNIT SCHEDULE

SCHEDULE NOTES
1. PROVIDE MERV 8, 2" PLEATED, FILTER FOR BOTH AIR STREAMS AND FACTORY MOUNTED FILTER ALARMS.
2. FAN MOTORS SHALL BE ECM
3. PROVIDE MOTORIZED DAMPER ON OA AIRSTREAM
4. PROVIDE BACK DRAFT DAMPER ON EA AIRSTREAM
5. PROVIDE INDEPENDENT FAN CONTROL
6. PROVIDE 24 VAC TRANSFORMER FOR CONTROLS

MARK	MANUFACTURER	MODEL	CORE TYPE	UNIT WEIGHT	FAN								NOTES
					AIRFLOW	ESP	HP	MCA	MOP	VOLT	Ph	Hz	
ERU-1	RenewAire LLC	HE1XRTV	ENTHALPIC	300.00 lb	500 CFM	0.50 in-wg	0.75 hp	9 A	15 A	277 V	1	60 Hz	1, 3, 4, 6

238000 - ELECTRIC DUCT HEATER SCHEDULE

NOTES:
1. NOT USED

MARK	MANUFACTURER	MODEL	DIMENSIONS		AIR FLOW				HEATING ELEMENT		ELECTRICAL			NOTES
			HEIGHT	WIDTH	FLOW	VELOCITY	EAT	LAT	OUTPUT	STAGES	VOLT	Ph	Hz	
EH-1	INDEECO	QUA	0' - 10"	1' - 0"	500	630 FPM	30 °F	80 °F	3.3 kW	2	277 V	1	60 Hz	

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REVISION SCHEDULE

NO.	DESCRIPTION	DATE
1	Addendum #1	11/12/21
2	Addendum #2	11/18/21

MINOT CITY HALL RENOVATION

CITY OF MINOT
MINOT, ND

CITY PROJECT 4466

DATE
11/04/21

PHASE
CONSTRUCTION DOCUMENTS

PROJECT
21019

SHEET
M402
MECHANICAL SCHEDULES

DRAWN BY: JRS

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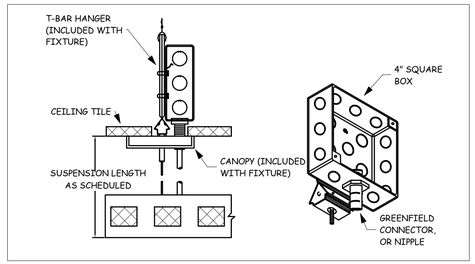
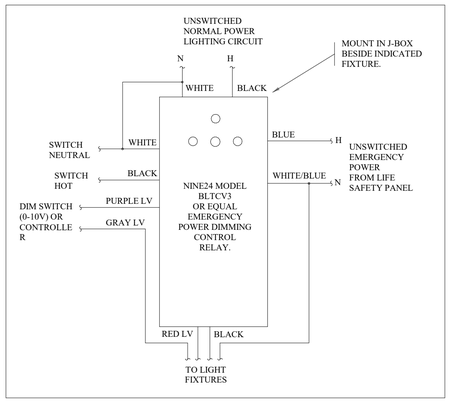


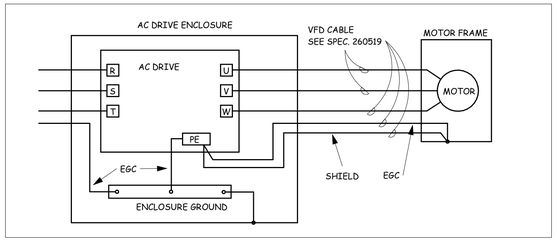
2 / E100 INDIRECT FIXTURE INSTALLATION DETAIL

1/8" = 1'-0"



4 / E100 EMERGENCY SWITCHING DETAIL - DIMMING

NTS



5 / E100 VFD CONNECTION DETAIL

NTS

ELECTRIC HEAT SCHEDULE					
TYPE	MANUFACTURER	CATALOG NO.	WATTAGE	VOLTAGE	REMARKS
CH-1,2	BERKO	SRA2027DSF	2000	277	RECESSED ELECTRIC WALL HEATER WITH INTEGRAL THERMOSTAT AND DISCONNECT SWITCH.

NOTES:

1. CONTINGENT UPON MEETING ALL SPECIFICATIONS, THE FOLLOWING HEATER MANUFACTURERS ARE ACCEPTABLE FOR BIDDING: CHROMALUX, ELECTROMODE, QMARK, RAYWALL, AND DIMPLEX.
2. DISCONNECT SWITCH AND/OR THERMOSTAT SHALL COMPLY WITH NEC "POSITIVE OFF" REQUIREMENTS.

ACCESS CONTROL SYSTEMS

	ELECTRIC DOOR CONTROL	
	DOOR POSITION SENSOR	
CR	PROXIMITY CARD READER (MOUNT 52" AFF)	52"
ACPX	DOOR CONTROL PANEL	
PS	POWER SUPPLY	
	INTERCOM/DOOR CONTROL	
	SECURITY CAMERA - SEE SPECIFICATION SECTION 282300 FOR TYPE	

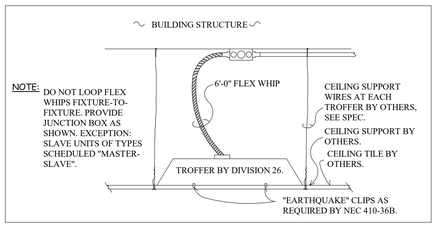
STANDARD ABBREVIATIONS

AC	ABOVE COUNTER (MIN 4" ABOVE BACKSPLASH)	IL	INTERLOCK
AFF	ABOVE FINISHED FLOOR	LV	LOW VOLTAGE
AFG	ABOVE FINISHED GRADE	MC	MECHANICAL CONTRACTOR
AHU	AIR HANDLING UNIT	MCA	MINIMUM CIRCUIT AMPACITY
ATC	AUTOMATIC TEMPERATURE CONTROL	MCB	MAIN CIRCUIT BREAKER
BOF	BOTTOM OF FIXTURE	MLO	MAIN LUG ONLY
CKT	CIRCUIT	NC	NURSE CALL
CU	CONDENSING UNIT	NFDS	NON-FUSIBLE DISCONNECT SWITCH
CUH	CABINET UNIT HEATER	NR	NOT REQUIRED
DT	DUST TIGHT	P	PAGIN/BACKGROUND MUSIC
DTR	DATA RACK	PA	PUBLIC ADDRESS
EC	ELECTRICAL CONTRACTOR	PRV	POWER ROOF VENTILATOR
EF	EXHAUST FAN	RF	RELIEF FAN
EGC	EQUIPMENT GROUNDING CONDUCTOR	RGSC	RIGID GALVANIZED STEEL CONDUIT
EM	EMERGENCY	RT	RAIN-TIGHT
EP	EXPLOSION PROOF	RTU	ROOFTOP UNIT
EWC	ELECTRIC WATER COOLER	S	SECURITY
EWH	ELECTRIC WATER HEATER	SD	SEE DETAIL
F	FUSED	SS	SURGE SUPPRESSION
FA	FIRE ALARM	SW	SWITCH
FACP	FIRE ALARM CONTROL PANEL	T	TELEPHONE
FARA	FIRE ALARM REMOTE ANNUNCIATOR	TOP	TOP OF PANEL
FDS	FUSIBLE DISCONNECT SWITCH	TSSW	TWO SPEED SEPERATE WINDING
FLA	FULL LOAD AMPERES	TTB	TELEPHONE TERMINAL BOARD
FVNR	FULL VOLTAGE NON REVERSING	VT	VAPOR TIGHT
FVR	FULL VOLTAGE REVERSING	W	WALL MTG. (46" AFF)
IC	INTERCOM	WAP	WIRELESS ACCESS POINT
IG	ISOLATED GROUND	WP	WEATHERPROOF
		WT	WATER TIGHT
		WM	WIREMOLD

SPECIAL SYMBOLS PECULIAR TO THIS PROJECT

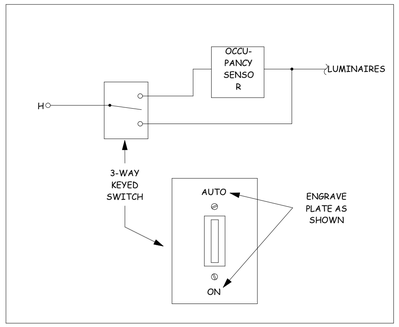
SPECIAL ABBREVIATIONS PECULIAR TO THIS PROJECT

RACS	TWO-WAY COMMUNICATION CALL STATION
RACP	TWO-WAY COMMUNICATION CONTROL PANEL



1 / E100 TROFFER INSTALLATION DETAIL

1/8" = 1'-0"



3 / E100 OCCUPANCY SENSOR CONTROL

1/8" = 1'-0"

STANDARD ELECTRICAL SYMBOLS

BASED ON ANSI Y32.9-1972, ANSI A117.1-1986, AND FEDERAL REGISTER
56-144(ADA) MOUNTING HEIGHT MEASUREMENTS SHALL BE MADE FROM FINISH FLOOR TO CENTER LINE OF OUTLET

SYMBOL	DESCRIPTION	MTG. HT.
	LIGHTING OUTLETS	
A,1 b	CEILING LUMINAIRE. TYPE A, CKT 1, SW b.	
	WALL MOUNTED LUMINAIRE.	SCHEDULED
	TROFFER LUMINAIRE, SLASH INDICATES UNSWITCHED.	
	STRIP LUMINAIRE WITH WIRE GUARD.	
	CEILING MOUNTED EXIT SIGN, SHADING INDICATES LIGHTED FACE.	
	WALL MOUNTED EXIT SIGN.	
	EMERGENCY BATTERY UNIT	
	REMOTE SEALED BEAM	SCHEDULED
PLH	PORCELAIN LAMPHOLDER. 100A LAMP LED LAMP EQUIVALENT	SCHEDULED
J	JUNCTION BOX	
	RECEPTACLE OUTLETS	
1	SINGLE. CKT 1	18"
	DUPLEX	18"
	DUPLEX - SPLIT WIRED	18"
	DUPLEX - GROUND FAULT CIRCUIT INTERRUPTER	18"
	DUPLEX - EMERGENCY	18"
	DOUBLE DUPLEX	
A	SPECIAL CONFIGURATION. DESIGNATION REFERS TO SCHEDULE	SCHEDULED
18	MULTI-OUTLET ASSEMBLY. ARROWS EXTEND TO LIMIT OF INSTALLATION. SUBSCRIPT INDICATES SPACING OF OUTLETS	82"
C	CLOCK RECEPTACLE	
	DUPLEX RECEPTACLE - FLOOR BOX	
	SWITCH OUTLETS	
S	SINGLE POLE	46"
S_2	DOUBLE POLE	46"
S_3	THREE-WAY	46"
S_4	FOUR-WAY	46"
S_K	KEY OPERATED	
S_M	MOTOR - PROVIDE OVERLOAD UNIT AS REQ'D. TOGGLE ACCEPTABLE IF INTERNAL THERMAL PROTECTION INCLUDED. SWITCH NOT REQ'D IF MOTOR ASSEMBLY HAS INTEGRAL DISCONNECTING MEANS.	
S_P	PILOT HANDLE	46"
S_T	TIME DELAY	46"
D	DIMMER - 1000W UNLESS OTHERWISE INDICATED	46"
SS	GANGED SWITCHES - ARROW INDICATES MULTI-LEVEL SWITCHING	46"
	WALL MOUNTED OCCUPANCY SENSOR	
	CEILING MOUNTED OCCUPANCY SENSOR. TYPE a, SW b. REFER TO SCHEDULE FOR TYPE	
	COMMUNICATION/DATA SYSTEM OUTLETS	
	VOICE OUTLET - ONE JACK PER TRIANGLE	18"
	VOICE OUTLET OR DATA OUTLET - FLOOR BOX	
	DATA OUTLET - ONE JACK PER TRIANGLE	18"
B	BELL	
B	BUZZER	
I	INTERCOM STATION	46"
M	MICROPHONE OUTLET	18"
T	TELEVISION OUTLET	18"
V	VOLUME CONTROL	46"
	PUSH BUTTON	
S	SPEAKER/BAFFLE/BACKBOX COMBINATION	CEILING
	CLOCK	84"
AV	AUDIO/VIDEO CONNECTION BOX - HDMI TYPICAL	18"
	MISCELLANEOUS	
1	PLAN OR DETAIL NOTE	
	SPECIAL PURPOSE CONNECTION - AS REQUIRED BY EQUIPMENT MANUFACTURER. CO-ORDINATE ROUGH-IN WITH SHOP DWG.	
	BRANCH CIRCUIT PANELBOARD, SHADING INDICATES NEW PANEL	TOP 75"
	CONTROL PANEL	
	EXTERNALLY OPERATED DISCONNECT SWITCH	
	CONTROLLER OR RELAY	
	COMBINATION CONTROLLER AND DISCONNECTION MEANS	
1	MOTOR. DESIGNATION REFERS TO SCHEDULE.	
2	EQUIPMENT DESIGNATION. SEE SCHEDULE.	
SB-1 T	ELECTRIC HEAT TO SCALE. DESIGNATION REFERS TO SCHEDULE. "T" INDICATES INTEGRAL THERMOSTAT.	
T_E	THERMOSTAT-PROVIDED BY DIV. 26	46"
T	THERMOSTAT-FURNISHED BY DIV. 23, INSTALLED BY DIV. 26	46"
H	HUMIDISTAT-FURNISHED BY DIV. 23, INSTALLED BY DIV. 26	46"
P	POTENTIOMETER-FURNISHED BY DIV. 23, INSTALLED BY DIV. 26	46"
T_S	TIME SWITCH	
P_S	PHOTOELECTRIC SWITCH	
	CIRCUITING	
	HOME RUN. MIN 3/4" C. ARROWS AND SUBSCRIPTS INDICATE NUMBER AND IDENTIFICATION OF CIRCUITS.	
	CONTROL WIRE. SEE SPECIFICATION SECTION 260536	
	EMERGENCY. MIN 1/2" C-#10 AWG.	
T	TELEPHONE. MIN 3/4"C, HOME RUN TO TERMINAL BOARD	
T	TELEPHONE. MIN 3/4"C, STUB INTO CEILING SPACE	
LV	LOW VOLTAGE. MIN 1/2"C-#14 AWG AS REQ'D.	
FA	SPECIAL SYSTEMS. MIN 3/4"C. PROVIDE CONDUCTORS AS REQ'D BY MANUFACTURER. SUBSCRIPT INDICATES SYSTEM. SEE STANDARD ABBREVIATIONS.	
	FIRE ALARM SYSTEMS	
P	DETECTOR. SUPERSCRIPT INDICATES ZONE. SUBSCRIPT DISCRIBES INITIATION: D-DUCT, R-RATE OF RISE THERMAL, F-FIXED TEMPERATURE THERMAL, I-IONIZATION, P-PHOTO-ELECTRIC.	CEILING
C	CHIME	88"
b	MAGNETIC DOOR HOLDER	
F	FAN RELAY	
F_S	FLOW SWITCH	
M	MANUAL STATION	46"
A	AUDIBLE ALARM NOTIFICATION APPLIANCE (HORN)	88"
V	VISUAL ALARM NOTIFICATION APPLIANCE	88"
AV	COMBO AUDIBLE-VISUAL ALARM NOTIFICATION APPLIANCE	88"
VS	MAIN VALVE SUPERVISORY ("TAMPER") SWITCH	

This document was originally issued and sealed by Jason L. Hunze registration number 4879, on November 4, 2021 and is stored at the office of Prairie Engineering, P.C.

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REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
MINOT CITY HALL RENOVATION
MINOT, ND

CITY PROJECT 4466

DATE
11/04/21

PHASE
CONSTRUCTION DOCUMENTS

PROJECT
21018

SHEET
E100
SCHEDULES & DETAILS

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FIXTURE SCHEDULE

TYPE	MANUFACTURER	CATALOG NO.	LAMPS NO.	LAMPS TYPE	FINISH	MOUNTING	REMARKS
G	LITHONIA HALO	LDN6 40/20 LO6 AR LSS MVOLT GZ1 USPOM HC6 20 D010 HM6 12 840 61 MD H	LED	2,000 DELIVERED LUMENS	LOW IRIDESCENT SEMI-SPECULAR SILVER	RECESSED CEILING	2,000 LUMEN 6" LED DOWNLIGHT WITH NORMAL DISTRIBUTION.
G1							SAME AS TYPE 'G' FIXTURE EXCEPT WITH 1,500 DELIVERED LUMENS.
G2							SAME AS TYPE 'G' FIXTURE EXCEPT WITH 1,500 DELIVERED LUMENS AND 2,700K COLOR TEMPERATURE.
G3	LITELINE HALO	DL6 15W WH SLD612 8 40 WH UNV	LED	1,000 DELIVERED LUMENS	WHITE	SURFACE CEILING	6" LED SURFACE MOUNT DOWNLIGHT WITH WET LOCATION RATING AND 277 VOLTAGE DRIVER. SEE SPEC. 265100 FOR FURTHER DETAILS.
G4	LITHONIA HALO	LDN4CYL 40/15 LO4 AR LSS MVOLT GZ1 FCM WL HCC4S 15 D010 HM4 12 840 41 MD H	LED	1,500 DELIVERED LUMENS	DARK BRONZE	SURFACE CEILING	4" LED SURFACE MOUNT CYLINDER WITH WET LOCATION RATING. SEE SPEC. 265100 FOR FURTHER DETAILS.
G5					BLACK	SUSPENDED 14' AFF	SAME AS TYPE "G4" EXCEPT CABLE SUSPENDED, 2,000 LUMEN OUTPUT.
H	PEERLESS CORELITE	BRM9L LLP 32FT MSL8 80CRI TUWH RHYR ID1500LMF 60/40 DARK NLT MVOLT SCT F1A/48A J3 F L 60L 8 2765 1 D UNV W2A AC48 UM 32FT	LED	1,500 LUMENS PER FT	WHITE	SUSPENED 8' AFF	32FT RECTANGULAR LED DIRECT/INDIRECT SUSPENDED FIXTURE WITH TUNABLE WHITE 2700K-6500K, 0-10V DIMMING DRIVER, 60% UPLIGHT AND 40% DOWNLIGHT.
K	EVENLITE LEGION LIGHTING	WW EM SL CT EMSW 15 40 SV EM NS	LED	1,500 DELIVERED LUMENS	SILVER	WALL 9'-6" AFG	ARCHITECTURAL LED WALL PACK WITH BOTH NORMAL AND EMERGENCY LIGHTING, INTEGRAL PHOTOEYE, 120/277 DRIVER, SELF-TEST/SELF-DIAGNOSTIC DRIVER, INTEGRAL HEATER FOR COLD WEATHER OPERATION RATED DOWN TO -13F.
L	Q-TRAN CALI LIGHTING	SW24/3.0 DRY 40 X X BK CL2P MATCH // SLIM ST SST CL X 88-INCH // QZ 60W UNV 24V PH/010 LPL8150-LPL CL 4 O-10V LED-4.0K DRY NA LPL8150-PC // TRA40-E	LED	300 LUMENS/FT	-	DISPLAY CASE, SURFACE MOUNT TO FRONT FACE BEHIND GLASS	88-INCH LED TAPE LIGHT MOUNTED IN DISPLAY CABINET WITH SLIM CLEAR LENS, EXTRUDED HOUSING, 277V DRIVER, AND ALL REQUIRED ACCESSORIES FOR A COMPLETE INSTALLATION.
L1							SAME AS TYPE "L" EXCEPT 70-INCH LONG.
AA	LITHONIA MCGRAW-EDISON	DSX1 LED P4 40K T4M MVOLT SPUMBA NLTAIR2 PIRHN GLEON SA2 C 740 U T4FT MS/DIM-L40W FSIR-100	LED	14,000 DELIVERED LUMENS	DARK BRONZE	EXISTING POLES	ARCHITECTURAL LED SITE LIGHT WITH TYPE 4 DITRIBUTION, INTEGRAL MOTION SENSOR WITH PHOTOEYE, SET UNOCCUPIED DIM LEVEL TO 20%, AND 4,000K COLOR TEMPERATURE.

NOTES:

1. WALL MOUNT DIRECTLY ABOVE EXIT DOOR WHERE POSSIBLE. CEILING OR END MOUNT IN REMAINING LOCATIONS AS DICTATED BY BUILDING CONDITIONS.

FIXTURE SCHEDULE

TYPE	MANUFACTURER	CATALOG NO.	LAMPS NO.	LAMPS TYPE	FINISH	MOUNTING	REMARKS
A	LITHONIA METALUX	2BLT4 48L ADP MVOLT EZ1 LP840 24CZ2 50 UNV L840 CD 1	LED	4,800 DELIVERED LUMENS	WHITE	SD 1/E100	2' X 4' LED FIXTURE WITH ILLUMINATED RIBBED CENTER BASKET. SEE SPEC. 265100.
A1							SAME AS TYPE "A" EXCEPT ALWAYS ON EMERGENCY CIRCUIT.
A2							SAME AS TYPE "A" EXCEPT WITH 6,000 LUMEN OUTPUT.
A3	LITHONIA METALUX	2BLT2 40L ADP MVOLT EZ1 LP840 22CZ2 39 UNV L840 CD 1	LED	4,000 DELIVERED LUMENS	WHITE	SD 1/E100	2' X 2' LED FIXTURE WITH ILLUMINATED RIBBED CENTER BASKET. SEE SPEC. 265100.
A4							SAME AS TYPE "A3" EXCEPT ALWAYS ON EMERGENCY CIRCUIT. 1
A5							SAME AS TYPE "A" EXCEPT INCLUDE INTEGRAL OCCUPANCY SENSTOR TO DIM DOWN TO 20%.
B	LITHONIA METALUX	CPX 2X4 6000LM 80CRI 40K SWL MIN10 ZT MVOLT 24FP6440C	LED	6,000 DELIVERED LUMENS	WHITE	SD 1/E100	2' X 4' LED FLAT PANEL. SEE SPEC. 265100.
B1							SAME AS TYPE "B" EXCEPT ALWAYS ON EMERGENCY CIRCUIT.
B2							SAME AS TYPE 'B' FIXTURE EXCEPT 4,000 DELIVERED LUMENS. 1
B3							SAME AS "B2" EXCEPT ALWAYS ON EMERGENCY CIRCUIT.
B4	LITHONIA METALUX	CPX 2X2 3200LM 80CRI 40K SWL MIN10 ZT MVOLT 22FP3240C	LED	3,200 DELIVERED LUMENS	WHITE	SD 1/E100	2' X 2' LED FLAT PANEL. SEE SPEC. 265100. 1
B5							SAME AS TYPE "B4" EXCEPT ALWAYS ON EMERGENCY CIRCUIT.
C	MARK LIGHTING FORUM LIGHTING	S4LS 8FT MSL8 80CRI 40K 1000LMF MIN1 MVOLT ZT BAA SAD 34 95 40 SAT S 8 UNV D10V	LED	1,000 LUMENS/FT	WHITE	SURFACE CEILING	8FT 4" LINEAR LED FIXTURE WITH DIFFUSE LENS. SEE SPEC. 265100.
C1							SAME AS TYPE "C" EXCEPT ALWAYS ON EMERGENCY CIRCUIT.
C2	MARK LIGHTING FORUM LIGHTING	S2LS 4FT MSL4 80CRI 40K 1000LMF MIN1 MVOLT ZT BAA SAD 32 95 40 SAT S 4 UNV D10V	LED	1,000 LUMENS/FT	WHITE	SURFACE CEILING	4FT 2" LINEAR LED FIXTURE WITH DIFFUSE LENS. SEE SPEC. 265100.
C3							SAME AS TYPE "C2" EXCEPT WITH 10W (MINIMUM) SELF-DIAGNOSTIC EMERGENCY DRIVER.
C4	MARK LIGHTING FORUM LIGHTING	S4LD LCB 4FT 80CRI 40K 1000LMF MIN1 MVOLT F2/72A CCRD BAA SAD 33 95 40 SAT C/72" 4FT UNV D10V	LED	1,000 LUMENS/FT	BLACK	SUSPENDED 14' AFF	4FT SUSPENDED 4" LINEAR LED FIXTURE WITH DIRECT LIGHTING, DIFFUSE LENS, AND EITHER CLEAR OR BLACK CORD/CABLE. SEE SPEC. 265100.
C5	MARK LIGHTING FORUM LIGHTING	SL2L LOP 8FT FLP FL 80CRI 40K 800LMF MIN1 UNV FL/BLKT ZT USPOM SAR-F 32 65 40 SAT 8 UNV BK D10V	LED	700 LUMENS/FT	BLACK	RECESSED WOOD CEILING	8FT 2" LINEAR LED FIXTURE WITH DIRECT LIGHTING, AND DIFFUSE LENS. SEE SPEC. 265100.
D	LITHONIA MULE LIGHTING	LQM P W 1 R 120/277 SW13 SS-MX A R 1 W USA SLCC "ON AIR"		INTEGRAL LED'S	WHITE HOUSING & FACE	WALL 8'-6" AFF	SINGLE FACE "ON AIR" SIGN WITH 120/277 DRIVER, RED LETTERING , AND THERMOPLASTIC HOUSING.
E	ISOLITE EVENLITE	DTH G 1 WH WH MTEB CHY 1 WW CN		INTEGRAL LED'S	WHITE HOUSING & FACE	NOTE 1	SINGLE FACE UNIVERSAL MOUNT HYBRID PHOTOLUMINESCENT AND LED EXIT WITH OPTICAL DIFFUSION SYSTEM, GREEN LETTERS, AND DIE CAST ALUMINUM HOUSING.
E1							SAME AS TYPE 'E' FIXTURE EXCEPT DUAL FACE.
E2	DUAL-LITE LITHONIA SURE-LITES	EV4102L ELM2LUVOLTSDRT SEL25SD	LED	2 LED HEADS	WHITE	WALL 9' AFF OR HIGH AS POSSIBLE	DECORATIVE EMERGENCY LED FIXTURE WITH SELF-DIAGNOSTICS AND 25FT (MINIMUM) SPACING.
F	LITHONIA METALUX	CLX L48 5000LM SEF RDL MVOLT GZ10 40K 80CRI 4SLSTP4040DD UNV	LED	5,000 DELIVERED LUMENS	WHITE	CHAIN HANG TO AVOID MECHANICAL EQUIPMENT	4' LED STRIP FIXTURE WITH ROUND DIFFUSE LENS.

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REVISION SCHEDULE

NO.	DESCRIPTION	DATE
1	Addendum #1	11/12/21

CITY OF MINOT
MINOT CITY HALL RENOVATION
MINOT, ND

CITY PROJECT 4466

DATE
11/04/21

PHASE
CONSTRUCTION DOCUMENTS

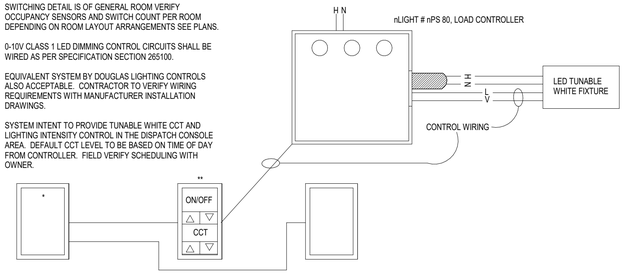
PROJECT
21018

SHEET
E101
LIGHTING SCHEDULE

11/12/2021 11:10:55 AM

NOTES:

1. SWITCHING DETAIL IS OF GENERAL ROOM VERIFY OCCUPANCY SENSORS AND SWITCH COUNT PER ROOM DEPENDING ON ROOM LAYOUT ARRANGEMENTS SEE PLANS.
2. 0-10V CLASS 1 LED DIMMING CONTROL CIRCUITS SHALL BE WIRED AS PER SPECIFICATION SECTION 265100.
3. EQUIVALENT SYSTEM BY DOUGLAS LIGHTING CONTROLS ALSO ACCEPTABLE. CONTRACTOR TO VERIFY WIRING REQUIREMENTS WITH MANUFACTURER INSTALLATION DRAWINGS.
4. SYSTEM INTENT TO PROVIDE TUNABLE WHITE CCT AND LIGHTING INTENSITY CONTROL IN THE DISPATCH CONSOLE AREA. DEFAULT CCT LEVEL TO BE BASED ON TIME OF DAY FROM CONTROLLER. FIELD VERIFY SCHEDULING WITH OWNER.



nLIGHT # nPOD TOUCH, COLOR AS SELECTED BY ARCH MOUNTED IN ROOM 121 FOR MANAGER CONTROL/OVERRIDE OF DISPATCH LIGHTING.

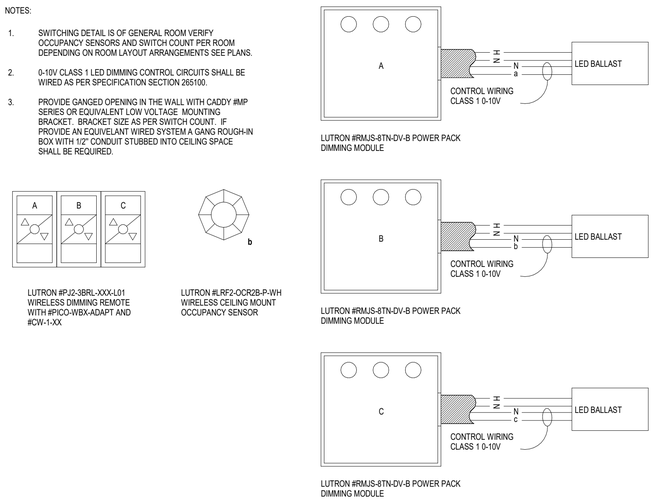
nLIGHT # nPODMA 2P DX CCT, COLOR AS SELECTED BY ARCH. MOUNTED IN DISPATCH ROOM 104 FOR MANUAL LIGHTING AND COLOR ADJUSTMENT.

nLIGHT # nECY MVOLT ENC GFXK, SYSTEM CONTROLLER WITH TOUCHSCREEN INTERFACE MOUNTED IN ROOM 112 FOR SYSTEM PROGRAMMING AND TIME OF DAY CONTROL.

5 E102 DISPATCH LIGHTING CONTROL
NTS

NOTES:

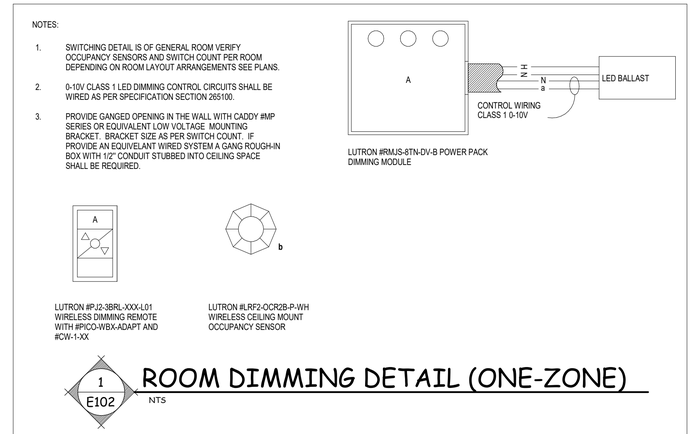
1. SWITCHING DETAIL IS OF GENERAL ROOM VERIFY OCCUPANCY SENSORS AND SWITCH COUNT PER ROOM DEPENDING ON ROOM LAYOUT ARRANGEMENTS SEE PLANS.
2. 0-10V CLASS 1 LED DIMMING CONTROL CIRCUITS SHALL BE WIRED AS PER SPECIFICATION SECTION 265100.
3. PROVIDE GANGED OPENING IN THE WALL WITH CADDY #MP SERIES OR EQUIVALENT LOW VOLTAGE MOUNTING BRACKET. BRACKET SIZE AS PER SWITCH COUNT. IF PROVIDE AN EQUIVELANT WIRED SYSTEM A GANG ROUGH-IN BOX WITH 1/2" CONDUIT STUBBED INTO CEILING SPACE SHALL BE REQUIRED.



3 E102 ROOM DIMMING DETAIL (THREE-ZONE)
NTS

NOTES:

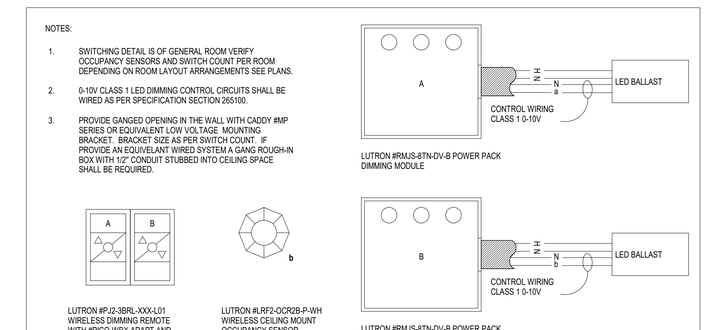
1. SWITCHING DETAIL IS OF GENERAL ROOM VERIFY OCCUPANCY SENSORS AND SWITCH COUNT PER ROOM DEPENDING ON ROOM LAYOUT ARRANGEMENTS SEE PLANS.
2. 0-10V CLASS 1 LED DIMMING CONTROL CIRCUITS SHALL BE WIRED AS PER SPECIFICATION SECTION 265100.
3. PROVIDE GANGED OPENING IN THE WALL WITH CADDY #MP SERIES OR EQUIVALENT LOW VOLTAGE MOUNTING BRACKET. BRACKET SIZE AS PER SWITCH COUNT. IF PROVIDE AN EQUIVELANT WIRED SYSTEM A GANG ROUGH-IN BOX WITH 1/2" CONDUIT STUBBED INTO CEILING SPACE SHALL BE REQUIRED.



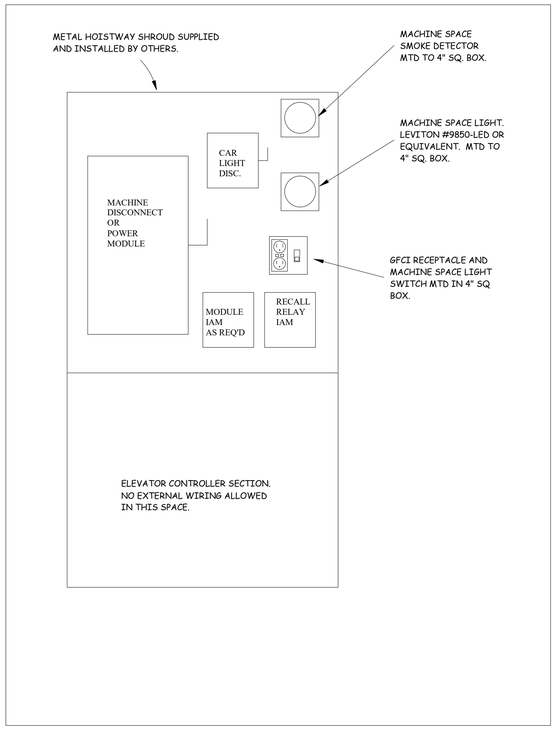
1 E102 ROOM DIMMING DETAIL (ONE-ZONE)
NTS

NOTES:

1. SWITCHING DETAIL IS OF GENERAL ROOM VERIFY OCCUPANCY SENSORS AND SWITCH COUNT PER ROOM DEPENDING ON ROOM LAYOUT ARRANGEMENTS SEE PLANS.
2. 0-10V CLASS 1 LED DIMMING CONTROL CIRCUITS SHALL BE WIRED AS PER SPECIFICATION SECTION 265100.
3. PROVIDE GANGED OPENING IN THE WALL WITH CADDY #MP SERIES OR EQUIVALENT LOW VOLTAGE MOUNTING BRACKET. BRACKET SIZE AS PER SWITCH COUNT. IF PROVIDE AN EQUIVELANT WIRED SYSTEM A GANG ROUGH-IN BOX WITH 1/2" CONDUIT STUBBED INTO CEILING SPACE SHALL BE REQUIRED.



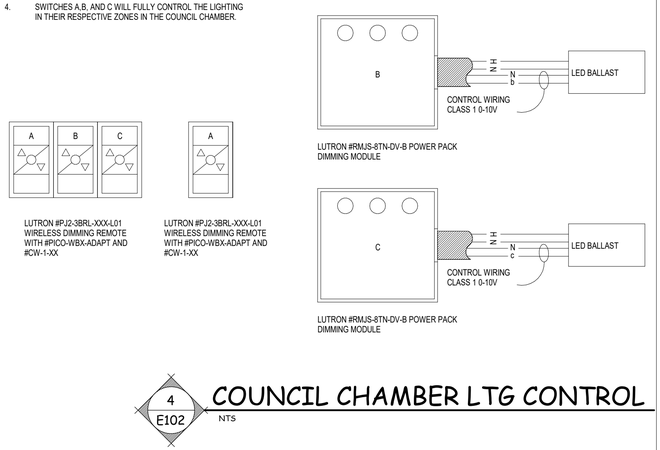
2 E102 ROOM DIMMING DETAIL (TWO-ZONE)
NTS



6 E102 MACHINE ROOMLESS ELEVATOR DETAIL
1/8" = 1'-0"

NOTES:

1. SWITCHING DETAIL IS OF GENERAL ROOM VERIFY OCCUPANCY SENSORS AND SWITCH COUNT PER ROOM DEPENDING ON ROOM LAYOUT ARRANGEMENTS SEE PLANS.
2. 0-10V CLASS 1 LED DIMMING CONTROL CIRCUITS SHALL BE WIRED AS PER SPECIFICATION SECTION 265100.
3. PROVIDE GANGED OPENING IN THE WALL WITH CADDY #MP SERIES OR EQUIVALENT LOW VOLTAGE MOUNTING BRACKET. BRACKET SIZE AS PER SWITCH COUNT. IF PROVIDE AN EQUIVELANT WIRED SYSTEM A GANG ROUGH-IN BOX WITH 1/2" CONDUIT STUBBED INTO CEILING SPACE SHALL BE REQUIRED.
4. SWITCHES A,B, AND C WILL FULLY CONTROL THE LIGHTING IN THEIR RESPECTIVE ZONES IN THE COUNCIL CHAMBER.



4 E102 COUNCIL CHAMBER LTG CONTROL
NTS

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REVISION SCHEDULE

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CITY OF MINOT
MINOT CITY HALL RENOVATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21018
SHEET **E102**
LIGHTING DETAILS

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1. FOLLOW MANUFACTURER'S RECOMMENDATIONS AND NFPA 90A 6.4.2 AND IMC 606.2 IN LOCATING DUCT DETECTORS:

A) "DOWNSTREAM OF THE AIR FILTERS AND AHEAD OF ANY BRANCH CONNECTIONS IN AIR SUPPLY SYSTEMS HAVING CAPACITY GREATER THAN 2000CFM (944 L/S)."

B) "IN RETURN AIR DUCT OR PLENUM UPSTREAM OF ANY FILTERS AND EXHAUST AIR CONNECTIONS IN AIR RETURN SYSTEMS HAVING CAPACITY GREATER THAN 2000 CFM (944 L/S)." (IMC 606.2)

C) "AT EACH STORY PRIOR TO THE CONNECTION TO A COMMON RETURN AND PRIOR TO ANY RECIRCULATION OR FRESH AIR INLET CONNECTION IN AIR RETURN SYSTEMS HAVING A CAPACITY GREATER THAN 15,000 CFM (7080 L/S) AND SERVING MORE THAN ONE STORY." (NFPA 90A 6.4.2 AND IMC 606.2)

NOTE: PROVIDE QUANTITY AS REQUIRED BY DUCT GEOMETRY.

2. SMOKE SAMPLING TUBES TO SPAN ENTIRE DUCT.

3. TO STARTING EQUIPMENT AT AHU.

4. TO FIRE ALARM CONTROL PANEL. SEPERATE ZONE REQUIRED FOR EACH MOTOR.

5. MOUNT REMOTE FAN SHUTDOWN RELAYS NEAR CONTROLLER OR EQUIPMENT.

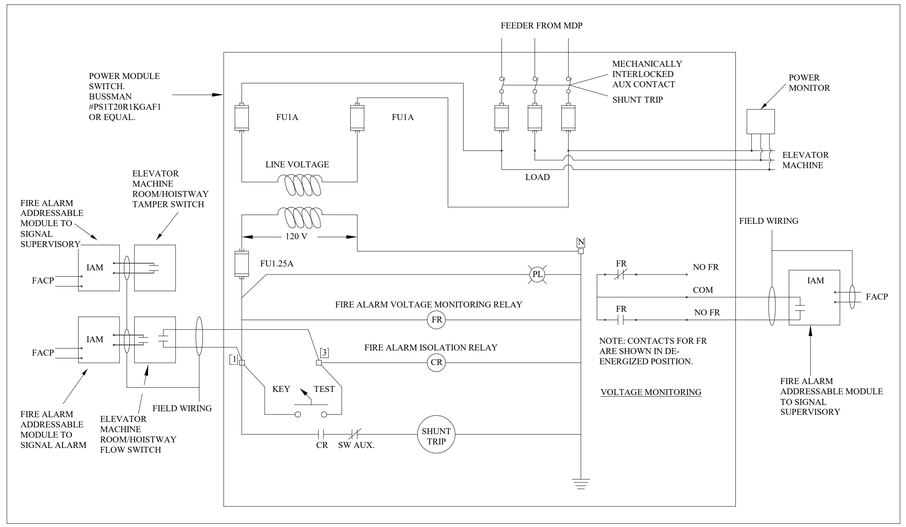
6. TO REMOTE ALARM INDICATOR/TEST STATION. LOCATE IN FINISHED CEILING IMMEDIATELY BELOW UNIT, OR ON VISIBLE WALL IN ASSOCIATED FAN ROOM.

NOTE: STATION NOT REQUIRED FOR ADDRESSABLE-TYPE DETECTORS.

7. IDENTIFY NOTE 1 AND NOTE 6 EQUIPMENT AS PER FOLLOWING EXAMPLE: AHU-1 SUPPLY, FACP ZONE 2. PROVIDE BLACK LAMINATED NAMEPLATE WITH WHITE LETTERS.

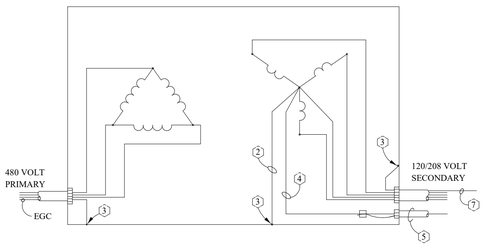
2 E103 DUCT DETECTION INSTALLATION

NTS



3 E103 ELEVATOR FIRE SPRINKLER DETAIL

NTS



NOTES (⬡)

1. ALL GROUNDING PER NEC 250. REFER TO NEC 250.30 FOR GROUNDING SEPARATELY DERIVED SYSTEMS.
2. BONDING JUMPER, SIZED IN ACCORDANCE WITH NEC 250.28(D).
3. COMPRESSION LUG BOLTED TO TRANSFORMER CASE.
4. GROUNDING ELECTRODE CONDUCTOR, SIZED IN ACCORDANCE WITH NEC 250.66. THE GROUNDING ELECTRODE SHALL BE THE NEAREST ONE OF THE FOLLOWING AS PER NEC 250-30(A)(7):

   A. METAL WATER PIPE GROUNDING ELECTRODE AS SPECIFIED IN NEC 250.52(A)(1), (ATTACHED WITH T&B 3900 SERIES WATER PIPE GROUND CLAMP), OR

   B. STRUCTURAL METAL GROUNDING ELECTRODE AS SPECIFIED IN NEC 250.52(A)(2), (ATTACHED WITH BOLTED COMPRESSION LUG).

   WHERE THE ELECTRODES LISTED ABOVE ARE NOT AVAILABLE, ANY OF THE OTHER ELECTRODES IDENTIFIED IN NEC 250.52(A) SHALL BE USED.
5. METALLIC CONDUIT ENCLOSING GROUNDING ELECTRODE CONDUCTOR SHALL COMPLY WITH NEC 250.64(E). PROVIDE GROUNDING BUSHINGS AT EACH END COMPLETE WITH JUMPERS SAME SIZE AS GROUNDING ELECTRODE CONDUCTOR. USE SPLIT BOLT CONNECTOR TO BOND JUMPER TO GROUNDING ELECTRODE CONDUCTOR.
6. PROVIDE FUSED DISCONNECT SWITCH ADJACENT TO TRANSFORMER WHEN REQUIRED BY NEC 240.21(B)(3).
7. SUPPLY SIDE BONDING JUMPER, SIZED IN ACCORDANCE WITH NEC 250.102.

1 E103 DISTRIBUTION TRANSFORMER

NTS

MOTOR & EQUIPMENT SCHEDULE

EQUIPMENT SERVED	CHARACTERISTICS HP	VOLT	PHASE	DISCONNECT (BY EC)	CONTROLLER (BY EC)	CONTROL INITIATING DEVICE: DEVICE	FURN	MTD	NOTE
AIR PURIFIER AP-1,2,3,4,5,6	1A	120	1	TOGGLE	INTEGRAL	ATC	ATC	ATC	
BOILER B-2	13.9A	480	3	30/3 FDS	INTEGRAL	ATC	ATC	ATC	
ELEC. DUCT HEATER EH-1	3.3KW	277	1	INTEGRAL	INTEGRAL	ATC	ATC	ATC	
ENERGY RECOVERY UNIT ERU-1	8.8 MCA	277	1	INTEGRAL	INTEGRAL	ATC	ATC	ATC	
EXISTING HEAT PUMP (SIZE 3/4 TON) EHP-13,14,26,27,28	5 MCA	277	1	EXISTING TOGGLE	INTEGRAL	ATC	ATC	ATC	
EXISTING HEAT PUMP (SIZE 1 TON) EHP-3,4,5,6,7,15,16, 18,30,31,32	10 MCA	277	1	EXISTING TOGGLE	INTEGRAL	ATC	ATC	ATC	
EXISTING HEAT PUMP (SIZE 1.5 TON) EHP-8,9,10,11,19,20, 21,22,33,34,35,36, 37,38	12 MCA	277	1	EXISTING TOGGLE	INTEGRAL	ATC	ATC	ATC	
EXISTING HEAT PUMP (SIZE 2 TON) EHP-12,25	13 MCA	277	1	EXISTING TOGGLE	INTEGRAL	ATC	ATC	ATC	
HEAT PUMP (SIZE 009) HP-1,64	5 MCA	277	1	TOGGLE	INTEGRAL	ATC	ATC	ATC	
HEAT PUMP (SIZE 012) HP-51,53,55	6 MCA	277	1	TOGGLE	INTEGRAL	ATC	ATC	ATC	
HEAT PUMP (SIZE 019) HP-46,54,67,68	12 MCA	277	1	TOGGLE	INTEGRAL	ATC	ATC	ATC	
HEAT PUMP (SIZE 024) HP-2,42,47,49,56,66	13 MCA	277	1	TOGGLE	INTEGRAL	ATC	ATC	ATC	
VERTICAL HEAT PUMP (SIZE 024) HP-59,60	14 MCA	277	1	TOGGLE	INTEGRAL	ATC	ATC	ATC	
HEAT PUMP (SIZE 030) HP-23,41,45	18 MCA	277	1	TOGGLE SEE NOTE 6	INTEGRAL	ATC	ATC	ATC	6
HEAT PUMP (SIZE 036) HP-48,50,52,57	11.1 MCA	480	3	3-POLE TOGGLE SEE NOTE 3	INTEGRAL	ATC	ATC	ATC	1,3
HEAT PUMP (SIZE 048) HP-39,43,44	13.3 MCA	480	3	3-POLE TOGGLE SEE NOTE 3	INTEGRAL	ATC	ATC	ATC	1,3
VERTICAL HEAT PUMP (SIZE 048) HP-61,62,63	13.3 MCA	480	3	3-POLE TOGGLE SEE NOTE 3	INTEGRAL	ATC	ATC	ATC	1,3
BOILER PUMP P-4	1/4	120	1	INCLUDED WITH STARTER	TOGGLE OR MANUAL AS REQ'D	ATC	ATC	ATC	
CIRC. PUMP CIRC-1,2	FRAC	120	1	INCLUDED WITH STARTER	TOGGLE OR MANUAL AS REQ'D	INTEGRAL	---	---	
WATER HEATER WH-1,2	4.5KW	208	1	30/2 FDS	INTEGRAL	INTEGRAL	---	---	
SECURITY GATE SG-1,2	3/4	480	3	3-POLE TOGGLE	INTEGRAL	KEYED SWITCH	GC	EC	
ELEVATOR ELV-1	15	480	3	100/3 FDS NOTE 4	INTEGRAL	PUSH BUTTON	GC	EC	4
BUILDING LOOP PUMPS P-1,2	10	480	3	INCLUDED WITH STARTER	VFD BY ATC SEE NOTE 7	ATC	ATC	ATC	7
HANDICAP DOOR OPERATOR HDO-1,2,3,4	FRAC	120	1	TOGGLE	INTEGRAL	WIRELESS PUSH BUTTON	GC	GC	5
CONDENSATE PUMP CP-1,2,3	FRAC	120	1	INTEGRAL CORD & PLUG	INTEGRAL	INTEGRAL	---	---	
SUMP PUMP SP-1,2,3	9.7A	120	1	INTEGRAL CORD & PLUG	INTEGRAL	INTEGRAL	---	---	8
EXHAUST FAN EF-1,2	FRAC	120	1	INTEGRAL CORD & PLUG	NR	TIMER NOTE 9	EC	EC	9
MOTORIZED SHADES MS-1,2,3,4,5,6,7,8,9, 10,11,12,13,14,15,16, 17,18,19,20,21,22,23, 24,25,26	FRAC	120	1	INTEGRAL CORD & PLUG	BY SHADE SUPPLIER	MOMENTARY CONTACT SWITCH	GC	EC	
EXISTING COOLING TOWER SPRAY PUMP CTS-1	5	480	3	INCLUDED WITH STARTER	COMBINATION FVNR 0	ATC	ATC	ATC	
EXISTING COOLING TOWER FAN CTF-1	10	480	3	EXISTING FDS	EXISTING VFD	ATC	ATC	ATC	

NOTES:

1. PROVIDE POWER MONITOR AS PER SPECIFICATION 262913.
2. PROVIDE DUCT DETECTION AS PER SPECIFICATION SECTION 283111 AND DETAIL 2/E103.
3. PROVIDE BRYANT #30003, OR EQUAL, 30A/3P TOGGLE DISCONNECT.
4. ALSO SD 3/E103 AND 6/E102 FOR ELEVATOR DETAILS AND SPECIFICATION SECTION 262822.
5. INTERCONNECT EXTERIOR HANDICAP OPERATORS WITH CONTROLLED ACCESS SYSTEM. SEE KEYNOTE S22 AND SPECIFICATION 281300 FOR FURTHER DETAILS.
6. PROVIDE BRYANT #3001, OR EQUAL, 30A/1P TOGGLE DISCONNECT.
7. VFD MOUNTED AND WIRED BY E.C. VFD SUPPLIED AND PROGRAMMED BY ATC.
8. SEPARATE POWER CIRCUITS REQUIRED FOR PUMP AND ALARM CONNECTIONS.
9. PROVIDE TORK MODEL# C530M OR EQUIVALENT, 30-MINUTE MECHANICAL SPRING WOUND TIMER FOR MANUAL FAN OPERATION.

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REVISION SCHEDULE

NO.	DESCRIPTION	DATE
2	Addendum #2	11/18/21

CITY OF MINOT MINOT CITY HALL RENOVATION MINOT, ND

CITY PROJECT 4466

DATE 11/04/21

PHASE CONSTRUCTION DOCUMENTS

PROJECT 21018

SHEET **E103**

MOTOR & EQUIPMENT SCHED.

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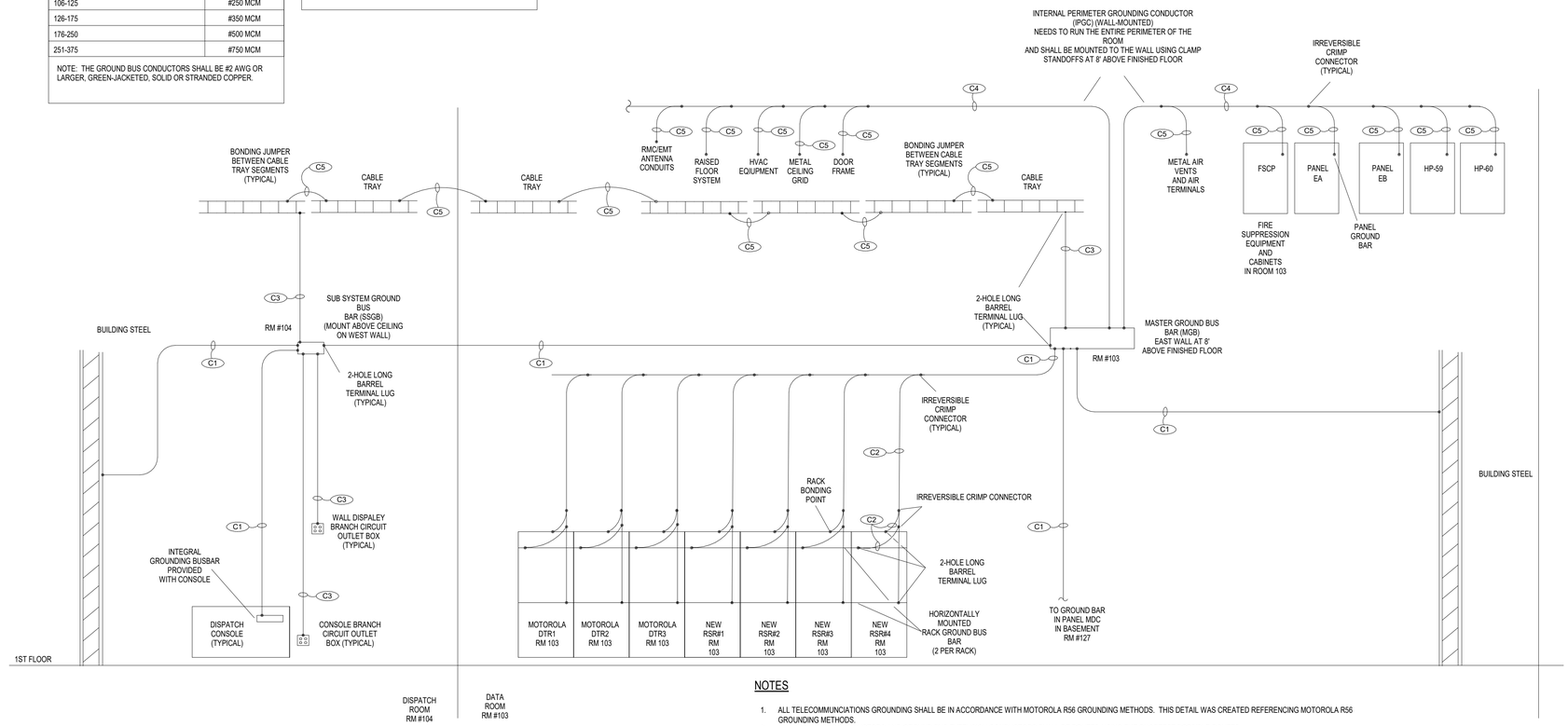
SIZING OF GROUND BUS CONDUCTORS	
CONDUCTOR LENGHT IN LINEAR FT	CONDUCTOR SIZE IN AWG/MCM
LESS THAN 33	#2 AWG
34-41	#1 AWG
52-52	#1/0 AWG
53-66	#2/0 AWG
67-84	#3/0 AWG
85-105	#4/0 AWG
106-125	#250 MCM
126-175	#350 MCM
176-250	#500 MCM
251-375	#750 MCM

NOTE: THE GROUND BUS CONDUCTORS SHALL BE #2 AWG OR LARGER, GREEN-JACKETED, SOLID OR STRANDED COPPER.

SIZING OF EQUIPMENT GROUNDING CONDUCTOR	
CONDUCTOR LENGHT IN LINEAR FT	CONDUCTOR SIZE IN AWG
LESS THAN 13	#6 AWG
14-20	#4 AWG
21-26	#3 AWG
27-33	#2 AWG

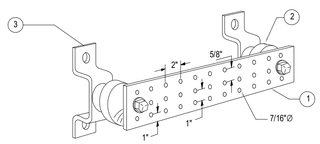
NOTE: THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE #6 AWG OR LARGER, GREEN-JACKETED, SOLID OR STRANDED COPPER.

GROUNDING SCHEDULE	
DESIG.	CABLE
C1	GROUND BUS CONDUCTOR (SEE CHART FOR SIZING)
C2	GROUND BUS EXTENSION CONDUCTOR (MATCH SIZE OF GROUND BUS CONDUCTOR FEEDING IT)
C3	EQUIPMENT GROUNDING CONDUCTOR (SEE CHART FOR SIZING)
C4	INTERNAL PERIMETER GROUND BUS CONDUCTOR (#2 AWG STRANDED OR SOLID CONDUCTOR)
C5	BONDING CONDUCTOR (#6 STRANDED)



1 E104 TELECOMMUNICATIONS BONDING DETAIL

NO SCALE



LEGEND
1 - TIN-PLATED COPPER GROUND BAR, 1/4" X 4" X 20", HOLE CENTERS TO MATCH NEMA DOUBLE HOLE LUG CONFIGURATION.
2 - INSULATORS
3 - WALL MOUNTING BRACKET
4 - PANDUIT #GB4B0624TPI-1

2 E104 GROUND BUS BAR DETAIL

NO SCALE

NOTES

1. ALL TELECOMMUNCIATIONS GROUNDING SHALL BE IN ACCORDANCE WITH MOTOROLA R56 GROUNDING METHODS. THIS DETAIL WAS CREATED REFERENCING MOTOROLA R56 GROUNDING METHODS.
2. ALL GROUND BUS CONDUCTORS AND GROUND BUS EXTENSION CONDUCTORS SHALL BE ROUTED USING THE SHORTEST POSSIBLE ROUTES.
3. ALL GROUND BUS EXTENSION CONDUCTORS SHALL BE ROUTED WITH ALL CONNECTIONS TO THE GROUND BUS CONDUCTOR POINTED IN THE DIRECTION OF THE MGB OR SSGB.
4. THE GROUND BUS CONDUCTOR BETWEEN THE SSGB AND MGB SHALL BE IN A DIRECT MANNER WITH NO SHARP BEND OR NARROW LOOPS. THE GROUNDING CONDUCTOR BEND ANGLES SHALL NOT BE LESS THEN 90 DEGREES NOR HAVE A BENDING RADIUS OF LESS THEN 8 INCHES. THE GROUND BUS CONDUCTOR IS PERMITTED TO BE ROUTED THROUGH THE CABLE TRAY.
3. THE GROUND BUS CONDUCTORS AND GROUND BUS EXTENSION CONDUCTORS SHALL BE RAN IN A DIRECT MANNER WITH NO SHARP BEND OR NARROW LOOPS. THE GROUNDING CONDUCTOR BEND ANGLES SHALL NOT BE LESS THEN 90 DEGREES NOR HAVE A BENDING RADIUS OF LESS THEN 8 INCHES.
4. ALL GROUND CONDUCTORS SHALL BE SEPARATED A MINIMUM OF 2" FROM CONDUCTORS OF OTHER CABLE GROUPS. GROUNDING CONDUCTORS MAY COME IN CONTACT WITH OTHER CABLE GROUPS IF THEY CROSS AT A 90 DEGREE ANGLE AND THE CROSSING ANGLE CAN BE MAINTAINED. AN EXCEPTION MAY BE WHEN CONDUCTORS ARE GROUPED TOGETHER TO ENTER OR EXIT A CABINET OR ENCLOSURE. GROUPING ONLY AT THIS POINT IS ACCEPTABLE, PROVIDED THE CONDUCTORS ARE SUITABLY SEPARATED ON EITHER SIDE OF THE OPENING.
5. TO MINIMIZE POTENTIAL INDUCTIVE EFFECT WHEN ROUTING A GROUNDING CONDUCTOR THROUGH FERROUS MATERIAL, THE CONDUCTOR SHALL BE SEPARATED FROM THE FERROUS MATERIAL BY A DISTANCE OF AT LEAST 2" WHERE ACHIEVABLE OR THE GROUNDING CONDUCTOR SHALL BE EFFECTIVELY BONDED TO THE FERROUS MATERIAL.
6. ALL GROUNDING CONDUCTORS SHALL BE JACKETED THHN/THWN.
7. NO RACEWAYS REQUIRED. IF RACEWAY IS NEEDED TO SLEEVE WALL/FLOOR OR FOR OTHER PURPOSES, RACEWAYS SHALL BE NON-FERROUS MATERIAL.
8. GROUNDING CONDUCTORS SHALL BE STRAPPED NEATLY TO THE WALL, EQUIPMENT OR STRUCTURE AT NO GREATER THAN 3FT INTERVALS. GROUNDING BUS CONDUCTORS ARE PERMITTED TO UTILIZE CABLE TRAY.

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REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
MINOT CITY HALL RENOVATION
MINOT, ND

CITY PROJECT 4466

DATE
11/04/21

PHASE
CONSTRUCTION DOCUMENTS

PROJECT
21018

SHEET
E104
TELECOMMUNICATIONS BONDING

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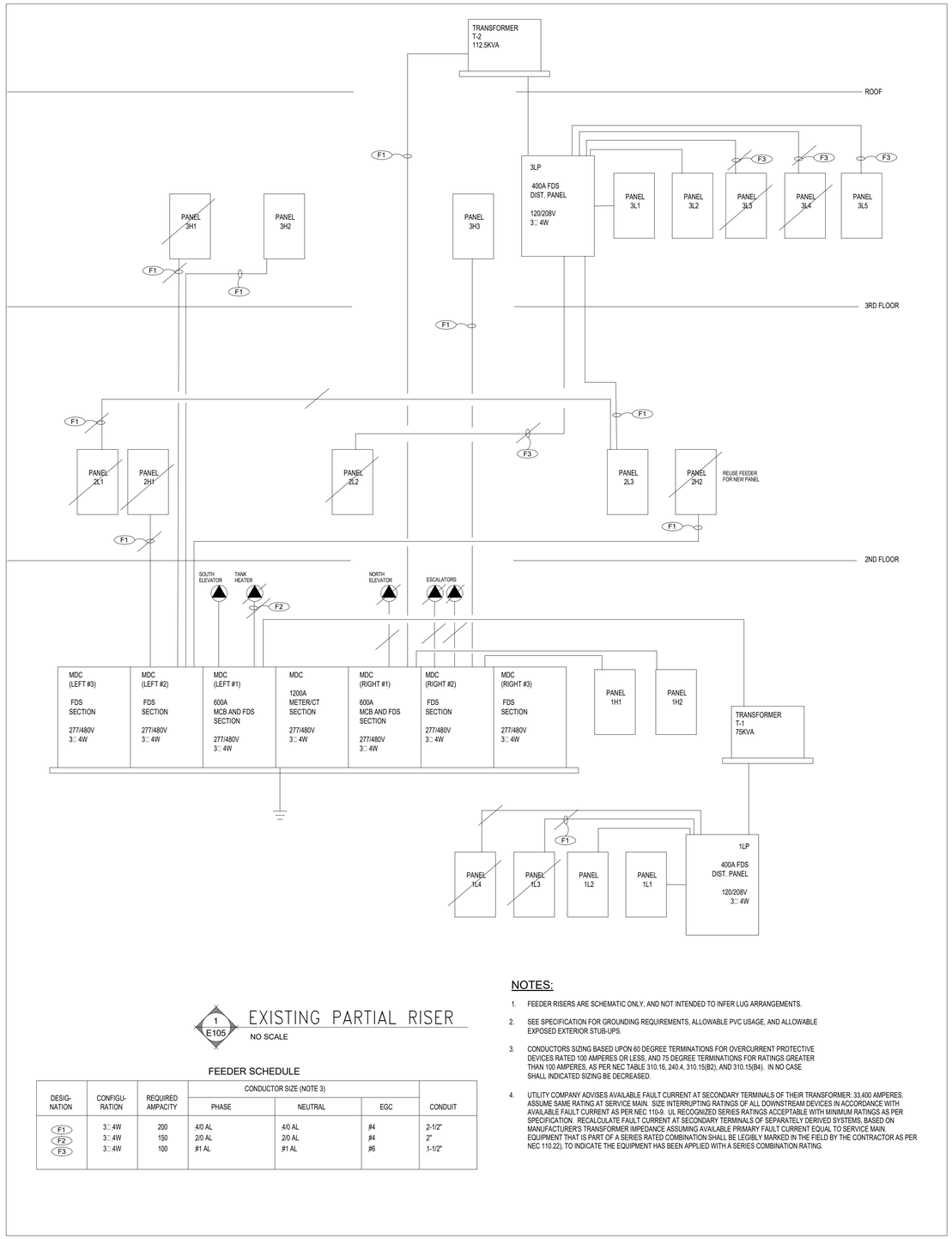


1 E105 EXISTING PARTIAL RISER

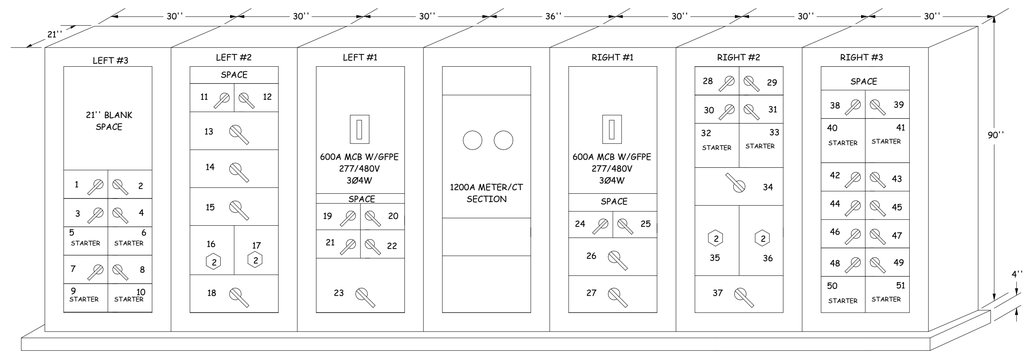
NO SCALE

FEEDER SCHEDULE

DESIG-NATION	CONFIGU-RATION	REQUIRED AMPACITY	CONDUCTOR SIZE (NOTE 3)			CONDUIT
			PHASE	NEUTRAL	EGC	
F1	3□ 4W	200	4/0 AL	4/0 AL	#4	2-1/2"
F2	3□ 4W	150	2/0 AL	2/0 AL	#4	2"
F3	3□ 4W	100	#1 AL	#1 AL	#6	1-1/2"

NOTES:

1. FEEDER RISERS ARE SCHEMATIC ONLY, AND NOT INTENDED TO INFER LUG ARRANGEMENTS.
2. SEE SPECIFICATION FOR GROUNDING REQUIREMENTS, ALLOWABLE PVC USAGE, AND ALLOWABLE EXPOSED EXTERIOR STUB-UPS.
3. CONDUCTORS SIZING BASED UPON 60 DEGREE TERMINATIONS FOR OVERCURRENT PROTECTIVE DEVICES RATED 100 AMPERES OR LESS, AND 75 DEGREE TERMINATIONS FOR RATINGS GREATER THAN 100 AMPERES, AS PER NEC TABLE 310.16, 240.4, 310.15(B2), AND 310.15(B4). IN NO CASE SHALL INDICATED SIZING BE DECREASED.
4. UTILITY COMPANY ADVISES AVAILABLE FAULT CURRENT AT SECONDARY TERMINALS OF THEIR TRANSFORMER: 33,400 AMPERES. ASSUME SAME RATING AT SERVICE MAIN. SIZE INTERRUPTING RATINGS OF ALL DOWNSTREAM DEVICES IN ACCORDANCE WITH AVAILABLE FAULT CURRENT AS PER NEC 110-9. UL RECOGNIZED SERIES RATINGS ACCEPTABLE WITH MINIMUM RATINGS AS PER SPECIFICATION. RECALCULATE FAULT CURRENT AT SECONDARY TERMINALS OF SEPARATELY DERIVED SYSTEMS, BASED ON MANUFACTURER'S TRANSFORMER IMPEDANCE ASSUMING AVAILABLE PRIMARY FAULT CURRENT EQUAL TO SERVICE MAIN. EQUIPMENT THAT IS PART OF A SERIES RATED COMBINATION SHALL BE LEGIBLY MARKED IN THE FIELD BY THE CONTRACTOR AS PER NEC 110.22), TO INDICATE THE EQUIPMENT HAS BEEN APPLIED WITH A SERIES COMBINATION RATING.



NOTES:

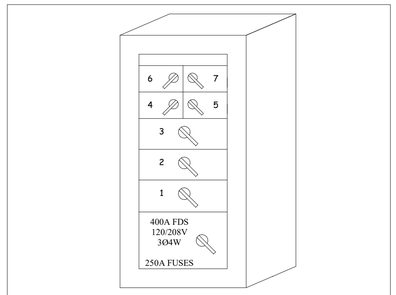
1. CONCRETE PAD AS PER SPECIFICATION 262413.
2. BY PASS EXISTING CONTACTORS. ATC WILL CONTROL HEAT PUMPS AT EACH EQUIPMENT LOCATION NOT VIA PANEL POWER.

EXISTING SWBD MDC SCHEDULE
SQUARE D - QMB SERIES

DESIG.	LOAD SERVED	TYPE	SIZE
1	SPARE	FDS	30/3
2	SPARE	FDS	30/3
3	COOLING TWR SPRAY PUMP	FDS	30/3
4	BLDG SYSTEM PUMP #1	FDS	30/3
5	SPRAY PUMP STARTER	---	---
6	SYSTEM PUMP #1 STARTER	---	---
7	COOLING TWR FAN #1	FDS	30/3
8	COOLING TWR FAN #2	FDS	30/3
9	TWR FAN #1 STARTER	---	---
10	TWR FAN #2 STARTER	---	---
11	SPARE	FDS	60/3
12	SPARE	FDS	60/3
13	PANEL 3H1	FDS	200/3
14	PANEL 2H2	FDS	110/3
15	PANEL 3H2	FDS	200/3
16	3H2 200A CONTACTOR	---	---
17	2H1 200A CONTACTOR	---	---
18	PANEL 2H1	FDS	200/3
19	SPARE	FDS	100/3
20	SPARE	FDS	100/3
21	ELEVATOR	FDS	70/3
22	BASEMENT XFMR T1	FDS	100/3
23	TANK HEATER	FDS	300/3
24	ELEVATOR	FDS	70/3
25	SPARE	FDS	100/3
26	PANEL 1H2	FDS	200/3
27	ROOF XFMR T2	FDS	175/3
28	ESCALATOR	FDS	30/3
29	ESCALATOR	FDS	30/3
30	BLDG AIR DIS. FAN	FDS	30/3
31	BLDG AIR SUPPLY FAN	FDS	30/3
32	AIR DIS. FAN STARTER	---	---
33	AIR SUPPLY FAN STARTER	---	---
34	PANEL 3H3	FDS	200/3
35	3H3 200A CONTACTOR	---	---
36	1H1 200A CONTACTOR	---	---
37	PANEL 1H1	FDS	200/3
38	SPARE	FDS	30/3
39	ROOM 100 AIR HANDLER	FDS	30/3
40	SPARE STARTER	---	---
41	RM 100 AH STARTER	---	---
42	SPARE	FDS	30/3
43	SPARE	FDS	30/3
44	SPARE	FDS	60/3
45	SPARE	FDS	60/3
46	SPARE	FDS	100/3
47	SPARE	FDS	100/3
48	BLDG SUPPLY PUMP #2	FDS	30/3
49	RM 200 AIR HANDLER	FDS	30/3
50	BLDG PUMP #2 STARTER	---	---
51	RM 200 AH STARTER	---	---

2 E105 EXISTING SWBD ELEVATION FDS

NTS

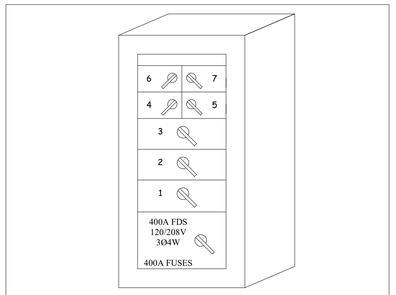


EXISTING 1LP SCHEDULE
SQUARE D QMB SERIES

DESIG.	LOAD SERVED	TYPE	SIZE
1	PANEL 1L3	FDS	200/3, 150A FUSES
2	PANEL 1L1	FDS	200/3, 125A FUSES
3	PANEL 1L2	FDS	200/3, 125A FUSES
4	EXISTING LOAD	FDS	60/3
5	EXISTING LOAD	FDS	60/3
6	EXISTING LOAD	FDS	30/3
7	SPARE	FDS	30/3

3 E105 EXISTING 1LP

NTS



EXISTING 3LP SCHEDULE
SQUARE D QMB SERIES

DESIG.	LOAD SERVED	TYPE	SIZE
1	PANEL 3L1	FDS	200/3, 125A FUSES
2	PANEL 2L1 & 2L3	FDS	200/3, 200A FUSES
3	PANEL 3L2	FDS	200/3, 150A FUSES
4	PANEL 2L2	FDS	100/3, 100A FUSES
5	PANEL 3L3	FDS	100/3, 100A FUSES
6	PANEL 1L4	FDS	100/3, 100A FUSES
7	PANEL 3L5	FDS	100/3, 60A FUSES

4 E105 EXISTING 3LP

NTS

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Prairie Engineering P.C.
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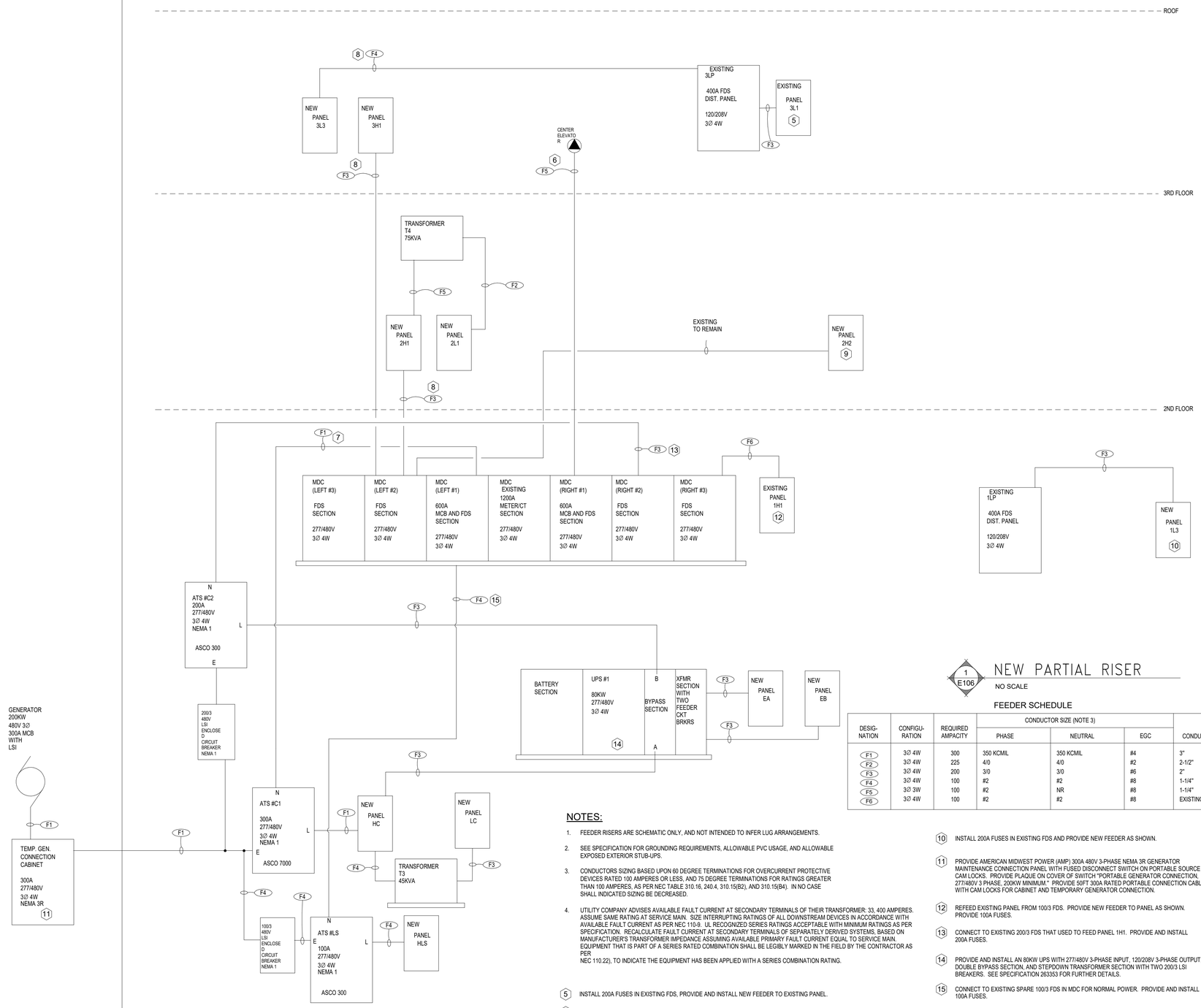
REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
MINOT CITY HALL RENOVATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21018
SHEET E105
EXISTING RISER

11/2/2021 2:26:48 PM



NEW PARTIAL RISER

1 / E106

NTS

NEW PARTIAL RISER

1 / E106

NO SCALE

FEEDER SCHEDULE

DESIG-NATION	CONFIGU-RATION	REQUIRED AMPACITY	CONDUCTOR SIZE (NOTE 3) PHASE	NEUTRAL	EGC	CONDUIT
F1	3Ø 4W	300	350 KCMIL	350 KCMIL	#4	3"
F2	3Ø 4W	225	4/0	4/0	#2	2-1/2"
F3	3Ø 4W	200	3/0	3/0	#6	2"
F4	3Ø 4W	100	#2	#2	#8	1-1/4"
F5	3Ø 3W	100	#2	NR	#8	1-1/4"
F6	3Ø 4W	100	#2	#2	#8	EXISTING

NOTES:

1. FEEDER RISERS ARE SCHEMATIC ONLY, AND NOT INTENDED TO INFER LUG ARRANGEMENTS.
2. SEE SPECIFICATION FOR GROUNDING REQUIREMENTS, ALLOWABLE PVC USAGE, AND ALLOWABLE EXPOSED EXTERIOR STUB-UPS.
3. CONDUCTORS SIZING BASED UPON 60 DEGREE TERMINATIONS FOR OVERCURRENT PROTECTIVE DEVICES RATED 100 AMPERES OR LESS, AND 75 DEGREE TERMINATIONS FOR RATINGS GREATER THAN 100 AMPERES, AS PER NEC TABLE 310.16, 240.4, 310.15(B2), AND 310.15(B4). IN NO CASE SHALL INDICATED SIZING BE DECREASED.
4. UTILITY COMPANY ADVISES AVAILABLE FAULT CURRENT AT SECONDARY TERMINALS OF THEIR TRANSFORMER: 33, 400 AMPERES. ASSUME SAME RATING AT SERVICE MAIN. SIZE INTERRUPTING RATINGS OF ALL DOWNSTREAM DEVICES IN ACCORDANCE WITH AVAILABLE FAULT CURRENT AS PER NEC 110-9. UL RECOGNIZED SERIES RATINGS ACCEPTABLE WITH MINIMUM RATINGS AS PER SPECIFICATION. RECALCULATE FAULT CURRENT AT SECONDARY TERMINALS OF SEPARATELY DERIVED SYSTEMS, BASED ON MANUFACTURER'S TRANSFORMER IMPEDANCE ASSUMING AVAILABLE PRIMARY FAULT CURRENT EQUAL TO SERVICE MAIN. EQUIPMENT THAT IS PART OF A SERIES RATED COMBINATION SHALL BE LEGIBLY MARKED IN THE FIELD BY THE CONTRACTOR AS PER NEC 110.22), TO INDICATE THE EQUIPMENT HAS BEEN APPLIED WITH A SERIES COMBINATION RATING.

5. INSTALL 200A FUSES IN EXISTING FDS, PROVIDE AND INSTALL NEW FEEDER TO EXISTING PANEL.
6. CONNECT TO UNUSED NORTH ELEVATOR FDS TO FEED NEW CENTER ELEVATOR. PROVIDE FUSES PER ELEVATOR NAMEPLATE MOPD RATING.
7. CONNECT TO UNUSED TANK HEATER FDS TO FEED PANEL 1H3 FOR NORMAL POWER. PROVIDE 300A FUSES.
8. RECONNECT TO EXISTING FDS THAT FED REMOVED PANEL OF SAME NAME.
9. RECONNECT TO EXISTING FEEDER THAT USED TO FEED THIS PANEL LOCATION.
10. INSTALL 200A FUSES IN EXISTING FDS AND PROVIDE NEW FEEDER AS SHOWN.
11. PROVIDE AMERICAN MIDWEST POWER (AMP) 300A 480V 3-PHASE NEMA 3R GENERATOR MAINTENANCE CONNECTION PANEL WITH FUSED DISCONNECT SWITCH ON PORTABLE SOURCE AND CAM LOCKS. PROVIDE PLAQUE ON COVER OF SWITCH "PORTABLE GENERATOR CONNECTION, 277/480V 3 PHASE, 200KW MINIMUM." PROVIDE 50FT 300A RATED PORTABLE CONNECTION CABLES WITH CAM LOCKS FOR CABINET AND TEMPORARY GENERATOR CONNECTION.
12. REFEED EXISTING PANEL FROM 100/3 FDS. PROVIDE NEW FEEDER TO PANEL AS SHOWN. PROVIDE 100A FUSES.
13. CONNECT TO EXISTING 200/3 FDS THAT USED TO FEED PANEL 1H1. PROVIDE AND INSTALL 200A FUSES.
14. PROVIDE AND INSTALL AN 80KW UPS WITH 277/480V 3-PHASE INPUT, 120/208V 3-PHASE OUTPUT, A DOUBLE BYPASS SECTION, AND STEPDOWN TRANSFORMER SECTION WITH TWO 200/3 LSI BREAKERS. SEE SPECIFICATION 263353 FOR FURTHER DETAILS.
15. CONNECT TO EXISTING SPARE 100/3 FDS IN MDC FOR NORMAL POWER. PROVIDE AND INSTALL 100A FUSES.

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REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
MINOT CITY HALL RENOVATION
MINOT, ND

CITY PROJECT 4466

DATE
11/04/21

PHASE
CONSTRUCTION DOCUMENTS

PROJECT
21018

SHEET
E106
REVISED PARTIAL RISER

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Prairie Engineering P.C.
Professional Consulting Engineers

11/2/2021 2:26:49 PM

Panel: EB

Volts: 120/208 Wye **Phase:** 3 **Wire:** 4
Mains Rating: 225 A **Mains Type:** MLO **Mounting:** Surface
EATON POW-R-LINE SERIES

Notes:

DESCRIPTION	CKT	BRK	CKT #.	GF CI	A	B	C	GF CI	CKT #	CKT	BRK	DESCRIPTION
RM 104 DESK REC	20	1	1		1500	180			2	1	20	RM 104 CNTR REC
RM 104 DESK REC	20	1	3				1500	1500	4	1	20	RM 104 DESK REC
RM 104 DESK REC	20	1	5				1500	1500	6	1	20	RM 104 DESK REC
RM 104 DESK REC	20	1	7		1500	1500			8	1	20	RM 104 DESK REC
RM 104 DESK REC	20	1	9				1500	1500	10	1	20	RM 104 DESK REC
RM 104 DESK REC	20	1	11				1500	720	12	1	20	RM 104 WALL TV
RM 104 DESK REC	20	1	13		1500	1500			14	1	20	RM 104 DESK REC
RM 104 WALL TV	20	1	15				720	2880	16	1	30	CITY IT DSR#1
CITY IT DTR#1	30	1	17				2880	2880	18	1	30	CITY IT DSR#2
RSR1 30A REC	30	1	19		2880	2880			20	1	30	RSR3 30A REC
RSR2 30A REC	30	1	21				2880	2880	22	1	30	RSR4 30A REC
MOTOROLA RACK 1	20	1	23				1600	1600	24	1	20	MOTOROLA RACK 2
MOTOROLA RACK 1	20	1	25		1600	1600			26	1	20	MOTOROLA RACK 2
MOTOROLA RACK 3	20	1	27				1600	1500	28	1	20	TTB REC RM 112
MOTOROLA RACK 3	20	1	29				1600	0	30	1	20	SPARE
SPARE	20	1	31		0	0			32	1	20	SPARE
SPARE	20	1	33				0	0	34	1	20	SPARE
SPARE	20	1	35				0	0	36	1	20	SPARE
--	--	--	37		0	0			38	--	--	--
--	--	--	39				0	0	40	--	--	--
--	--	--	41				0	0	42	--	--	--
	Amps per Phase:				140 A		155 A		132 A			

LOAD	CONNECTED	DEMAND	ADJUSTED
LIGHTING			
RECEPTACLES	50.9 kVA	59.83%	30.4 kVA
HVAC			
KITCHEN			
OTHER			
		Total kVA:	30.4 kVA
		Total Amps:	84.5 A

Panel: 1L3

Volts: 120/208 Wye **Phase:** 3 **Wire:** 4
Mains Rating: 200 A **Mains Type:** MLO **Mounting:** Surface
EATON POW-R-LINE SERIES

Notes: FACTORY INSTALLED 160KA SPD

DESCRIPTION	CKT	BRK	CKT #.	GF CI	A	B	C	GF CI	CKT #	CKT	BRK	DESCRIPTION
NORTHLAND IT UPS	30	2	1		2400	1664			2	2	20	NORTHLAND IT A/C
--	--	--	3				2400	1664	4	--	--	--
RM 150 COPIER	20	1	5				1500	1800	6	1	20	NH WALL DTR
RM 150 CNTR REC	20	1	7		1500	1800			8	1	20	NH WALL DTR
RM 150 FRIDGE	20	1	9				1680	1260	10	1	20	RM 151-155 RECS
RM 150 CNTR REC	20	1	11				1500	1260	12	1	20	RM 151-155 RECS
CNTR ELV PIT REC	20	1	13		180	1260			14	1	20	RM 151-155 RECS
RM 101, 145-149 RECS	20	1	15				720	1200	16	1	20	HANDICAP DR OPENERS
RM 101, 145-149 RECS	20	1	17				720	1524	X 18	1	20	SP-2
SP-1	20	1	19		1164	1524			X 20	1	20	SP-3
SPARE	20	1	21				0	0	22	1	20	SPARE
SPARE	20	1	23				0	0	24	1	20	SPARE
SPARE	20	1	25		0	0			26	1	20	SPARE
SPARE	20	1	27				0	0	28	1	20	SPARE
SPARE	20	1	29				0	0	30	1	20	SPARE
SPARE	20	1	31		0	0			32	1	20	SPARE
SPARE	20	1	33				0	0	34	1	20	SPARE
SPARE	20	1	35				0	0	36	1	20	SPARE
SPARE	20	1	37		0	0			38	1	20	SPARE
SPARE	20	1	39				0	0	40	1	20	SPARE
SPARE	20	1	41				0	0	42	1	20	SPARE
	Amps per Phase:				97 A		75 A		69 A			

LOAD	CONNECTED	DEMAND	ADJUSTED
LIGHTING			
RECEPTACLES	28.7 kVA	67.41%	19.4 kVA
HVAC			
KITCHEN			
OTHER			
		Total kVA:	19.4 kVA
		Total Amps:	53.7 A

Panel: HC

Volts: 480/277 Wye **Phase:** 3 **Wire:** 4
Mains Rating: 400 A **Mains Type:** MLO **Mounting:** Surface
EATON POW-R-LINE SERIES

Notes:FACTORY INSTALLED 160kA SPD, 200/3 SUB-FEED BREAKER TO UPS#1

DESCRIPTION	CKT	BRK	CKT #	GF CI	A	B	C	GF CI	CKT #	CKT	BRK	DESCRIPTION
ERU-1 (ON ROOF)	20	1	1		2438	3300			2	1	20	EH-1
HP-60	20	1	3				0	1480	4	1	20	RM 110-121 LTG
HP-59	20	1	5				3878	2000	6	1	20	RM 107 HEATER
RM 103-106 LTG	20	1	7		2443	2770			8	1	20	HP-6
HP-64	20	1	9			1385	0		10	3	30	PUMP P-2
HP-2	20	1	11				3601	0	12	--	--	--
BOILER B-2	20	3	13		3850	0			14	--	--	--
--	--	--	15			3850	3684		16	3	20	HP-63
--	--	--	17				3850	3684	18	--	--	--
PUMP P-1	30	3	19		3878	3684			20	--	--	--
--	--	--	21			3878	3684		22	3	20	HP-62
--	--	--	23				3878	3684	24	--	--	--
HP-61	20	3	25		0	3684			26	--	--	--
--	--	--	27			0	23440		28	3	60	TRANSFORMER T3
--	--	--	29				0	19740	30	--	--	--
HP-11	20	1	31		3324	17916			32	--	--	--
CTS-1	20	3	33			2105	3878		34	3	30	CTF-1
--	--	--	35				2105	3878	36	--	--	--
--	--	--	37		2105	3878			38	--	--	--
SPARE	20	1	39			0	0		40	1	20	SPARE
SPARE	20	1	41				0	0	42	1	20	SPARE
SPARE	20	1	43		0	0			44	1	20	SPARE
SPARE	20	1	45			0	0		46	1	20	SPARE
SPARE	20	1	47				0	0	48	1	20	SPARE
SPARE	20	1	49		0	0			50	1	20	SPARE
SPARE	20	1	51			0	0		52	1	20	SPARE
SPARE	20	1	53				0	0	54	1	20	SPARE
SPARE	20	1	55		0	0			56	1	20	SPARE
SPARE	20	1	57			0	0		58	1	20	SPARE
SPARE	20	1	59				0	0	60	1	20	SPARE
	Amps per Phase:				311 A		306 A		298 A			

LOAD	CONNECTED	DEMAND	ADJUSTED
LIGHTING	3.9 kVA	125.00%	4.9 kVA
RECEPTACLES	135.4 kVA	53.69%	72.7 kVA
HVAC	87.3 kVA	100.00%	87.3 kVA
KITCHEN	12.0 kVA	65.00%	7.8 kVA
OTHER	13.3 kVA	100.00%	13.3 kVA
		Total kVA:	186.0 kVA
		Total Amps:	223.7 A

Panel: EA

Volts: 120/208 Wye **Phase:** 3 **Wire:** 4
Mains Rating: 225 A **Mains Type:** MLO **Mounting:** Surface
EATON POW-R-LINE SERIES

Notes:

DESCRIPTION	CKT	BRK	CKT #	GF CI	A	B	C	GF CI	CKT #	CKT	BRK	DESCRIPTION
RM 104 DESK REC	20	1	1		1500	180			2	1	20	RM 104 CNTR REC
RM 104 DESK REC	20	1	3			1500	1500		4	1	20	RM 104 DESK REC
RM 104 DESK REC	20	1	5				1500	1500	6	1	20	RM 104 DESK REC
RM 104 DESK REC	20	1	7		1500	1500			8	1	20	RM 104 DESK REC
RM 104 DESK REC	20	1	9			1500	1500		10	1	20	RM 104 DESK REC
RM 104 DESK REC	20	1	11				1500	1500	12	1	20	RM 104 DESK REC
RM 104 DESK REC	20	1	13		1500	720			14	1	20	RM 104 WALL TV
RM 104 WALL TV	20	1	15			720	2880		16	1	30	CITY IT DSR#1
CITY IT DTR#1	30	1	17				2880	2880	18	1	30	CITY IT DSR#2
RSR1 30A REC	30	1	19		2880	2880			20	1	30	RSR2 30A REC
RSR4 30A REC	30	1	21			2880	2880		22	1	30	RSR3 30A REC
MOTOROLA RACK 1	20	1	23				1600	1600	24	1	20	MOTOROLA RACK 2
MOTOROLA RACK 1	20	1	25		1600	1600			26	1	20	MOTOROLA RACK 2
MOTOROLA RACK 3	20	1	27			1600	1680		28	1	20	TTB REC RM 112
MOTOROLA RACK 3	20	1	29				1600	0	30	1	20	SPARE
SPARE	20	1	31		0	0			32	1	20	SPARE
SPARE	20	1	33			0	0		34	1	20	SPARE
SPARE	20	1	35				0	0	36	1	20	SPARE
--	--	--	37		0	0			38	--	--	--
--	--	--	39			0	0		40	--	--	--
--	--	--	41				0	0	42	--	--	--
	Amps per Phase:				132 A		156 A		139 A			

LOAD	CONNECTED	DEMAND	ADJUSTED
LIGHTING			
RECEPTACLES	51.1 kVA	59.79%	30.5 kVA
HVAC			
KITCHEN			
OTHER			
		Total kVA:	30.5 kVA
		Total Amps:	84.7 A

Panel: HLS

Volts: 480/277 Wye **Phase:** 3 **Wire:** 4
Mains Rating: 100 A **Mains Type:** MLO **Mounting:** Surface
BUSSMAN QSCP SERIES FUSED PANELBOARD

Notes: FACTORY INSTALLED 120KA SPD

DESCRIPTION	CKT	BRK	CKT #.	GF CI	A	B	C	GF CI	CKT #	CKT	BRK	DESCRIPTION
1ST FLR EM LTG	20	1	1		1065	1592			2	1	20	2ND FLR EM LTG
3RD FLR EM LTG	20	1	3				1213	0	4	1	20	SPARE
SPARE	20	1	5						6	1	20	SPARE
SPARE	20	1	7		0	0			8	1	20	SPARE
SPARE	20	1	9				0	0	10	1	20	SPARE
SPARE	20	1	11						12	1	20	SPARE
SPARE	20	1	13		0	0			14	1	20	SPARE
SPARE	20	1	15				0	0	16	1	20	SPARE
SPARE	20	1	17						18	1	20	SPARE
	Amps per Phase:				10 A		5 A		0 A			

LOAD	CONNECTED	DEMAND	ADJUSTED
LIGHTING	1.8 kVA	125.00%	2.3 kVA
RECEPTACLES			
HVAC			
KITCHEN			
OTHER	2.0 kVA	100.00%	2.0 kVA
		Total kVA:	4.3 kVA
		Total Amps:	5.2 A

Panel: LC

Volts: 120/208 Wye **Phase:** 3 **Wire:** 4
Mains Rating: 200 A **Mains Type:** MCB **Mounting:** Surface
EATON POW-R-LINE SERIES

Notes:FACTORY INSTALLED 160KA SPD, L = PAD LOCKABLE BREAKER HANDLE

DESCRIPTION	CKT	BRK	CKT #.	GF CI	A	B	C	GF CI	CKT #	CKT	BRK	DESCRIPTION
RM 131 HVAC EQUIP	20	1	1		120	4000		X	2	2	50	RM 119 RANGE
1ST FLR ATC PANELS	20	1	3						4	--	--	--
BOILER PUMP P-4	20	1	5				696	1500	6	1	20	RM 116 COPIER
RM 114-116, 119 RECS	20	1	7		720	1560			8	1	20	RM 116 SHREDDER
RM 114-116, 119 RECS	20	1	9				720	1500	10	1	20	RM 119 CNTR REC
RM 114-116, 119 RECS	20	1	11				780	1500	12	1	20	RM 119 DISHWASHER
RM 117, 121-122 RECS	20	1	13		900	1500			14	1	20	RM 119 CNTR REC
RM 117, 121-122 RECS	20	1	15				900	1500	16	1	20	RM 119 CNTR REC
RM 117, 121-122 RECS	20	1	17				840	1500	18	1	20	RM 119 CNTR REC
RM 119 MICROHOOD	20	1	19	X	1500	1500			20	1	20	RM 119 CNTR REC
RM 119 FRIDGE	20	1	21	X			1500	1200	22	1	20	RM 106-110 RECS
RM 110 SHELF RECS	20	1	23	X			360	1080	24	1	20	RM 106-110 RECS
CONSOLE DESK PWR	20	1	25		1260	1260			26	1	20	CONSOLE DESK PWR
CONSOLE DESK PWR	20	1	27				1260	1260	28	1	20	CONSOLE DESK PWR
CONSOLE DESK PWR	20	1	29				1260	1260	30	1	20	CONSOLE DESK PWR
CONSOLE DESK PWR	20	1	31		1260	1260			32	1	20	CONSOLE DESK PWR
CONSOLE DESK PWR	20	1	33				1260	1260	34	1	20	CONSOLE DESK PWR
CONSOLE DESK PWR	20	1	35				1260	1260	36	1	20	CONSOLE DESK PWR
ACP# 1 & 2	20	1	37		1500	480			38	1	20	RM 103 CNTR REC
RM 135 REC	20	1	39			180	500		40	1	20	L RM 103 FIRE SUP. PNL
RM 135 FIRE SUP. PNL	20	L 1	41				0	3120	42	2	40	GEN SET POWER
RM 236 ACCESS CNTL...	20	1	43		1000	3120			44	--	--	--
RM 227 ACCESS...	20	1	45			1200	1000		46	1	20	RM 353 ATC & ACP CP
RM 253 ATC & PDPS	20	1	47				1000	500	48	1	20	RM 112 PDPS
FIRE ALARM	20	L 1	49		500	0			50	1	20	SPARE
SPARE	20	1	51			0	0		52	1	20	SPARE
SPARE	20	1	53				0	0	54	1	20	SPARE
SPARE	20	1	55		0	0			56	1	20	SPARE
SPARE	20	1	57			0	0		58	1	20	SPARE
SPARE	20	1	59				0	0	60	1	20	SPARE
	Amps per Phase:				198 A		167 A		149 A			

LOAD	CONNECTED	DEMAND	ADJUSTED
LIGHTING			
RECEPTACLES	33.4 kVA	64.95%	21.7 kVA
HVAC	1.4 kVA	100.00%	1.4 kVA
KITCHEN	12.0 kVA	65.00%	7.8 kVA
OTHER	13.3 kVA	100.00%	13.3 kVA
		Total kVA:	44.2 kVA
		Total Amps:	122.6 A

DRY TYPE TRANSFORMER SCHEDULE

DESIG.	KVA	PHASE	PRIMARY VOLTAGE	SECONDARY VOLTAGE	PRIMARY O/C PROTECTION	SECONDARY O/C PROTECTION	MOUNTING	REMARKS
T3	45	3	480	208	60/3 CB IN HC	200/3 MCB IN LC	FLOOR	
T4	75	3	480	208	100/3 CB IN 2H1	225/3 MCB IN 2L1	SUSPENDED	SEE STRUCTURAL DETAIL 8/S107 FOR HANGING REQUIREMENTS.

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REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
MINOT CITY HALL RENOVATION
MINOT, ND

CITY PROJECT 4466
DATE
11/04/21
PHASE
CONSTRUCTION DOCUMENTS
PROJECT
21018
SHEET
E107
PANEL SCHEDULES

This document was originally issued and sealed by Jason L. Hunze registration number 4879, on November 4, 2021 and is stored at the office of Prairie Engineering, P.C.

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Prairie Engineering P.C.
Professional Consulting Engineers

11/2/2021 2:26:50 PM

Panel: 3L3

Volts: 120/208 Wye **Phase:** 3 **Wire:** 4
Mains Rating: 100 A **Mains Type:** MLO **Mounting:** Recessed
EATON POW-R-LINE SERIES

Notes: FACTORY INSTALLED 120KA SPD

DESCRIPTION	CKT	BRK	CKT #.	GF CI	A		B		C		GF CI	CKT #.	CKT	BRK	DESCRIPTION
RM 322, 324 RECS	20	1	1		900	1440						2	1	20	RM 311,317-319,321,322...
RM 322, 324 RECS	20	1	3				1080	1440				4	1	20	RM 311,317-319,321,322...
RM 322, 324 RECS	20	1	5						1260	1260		6	1	20	RM 311,317-319,321,322...
RM 314-316,323 RECS	20	1	7		1440	1500						8	1	20	RM 312 COPIER
RM 314-316,323 RECS	20	1	9				1260	1500				10	1	20	RM 312 SHREDDER REC
RM 314-316,323 RECS	20	1	11						1080	900		12	1	20	RM 312-313 RECS
WAITING CNTR REC	20	1	13		1500	720						14	1	20	RM 312-313 RECS
WAITING FRIDGE	20	1	15				1500	720				16	1	20	RM 312-313 RECS
WAITING CNTR REC	20	1	17						1500	1620		18	1	20	RM 307-311 RECS
RM 304-306 RECS	20	1	19		1440	1440						20	1	20	RM 307-311 RECS
RM 304-306 RECS	20	1	21				1260	1440				22	1	20	RM 307-311 RECS
RM 304-306 RECS	20	1	23						1260	1260		24	1	20	RM 325 & 369 RECS
RM 305 AV RACK	20	1	25		1800	900						26	1	20	RM 325 & 369 RECS
RM 305 SHADES	20	1	27				1824	0				28	1	20	SPARE
SPARE	20	1	29						0	0		30	1	20	SPARE
SPARE	20	1	31		0	0						32	1	20	SPARE
SPARE	20	1	33				0	0				34	1	20	SPARE
SPARE	20	1	35						0	0		36	1	20	SPARE
SPARE	20	1	37		0	0						38	1	20	SPARE
SPARE	20	1	39				0	0				40	1	20	SPARE
SPARE	20	1	41						0	0		42	1	20	SPARE
	Amps per Phase:				111 A		103 A		85 A						

LOAD	CONNECTED	DEMAND	ADJUSTED
LIGHTING			
RECEPTACLES	28.9 kVA	67.27%	19.5 kVA
HVAC			
KITCHEN	4.5 kVA	90.00%	4.1 kVA
OTHER	1.8 kVA	100.00%	1.8 kVA
		Total kVA:	25.3 kVA
		Total Amps:	70.3 A

Panel: 2L1

Volts: 120/208 Wye **Phase:** 3 **Wire:** 4
Mains Rating: 225 A **Mains Type:** MCB **Mounting:** Surface
EATON POW-R-LINE SERIES

Notes:FACTORY INSTALLED 160KA SPD

DESCRIPTION	CKT	BRK	CKT #	GF CI	A		B		C		GF CI	CKT #	CKT	BRK	DESCRIPTION
WH-2	30	2	1		2250	1500						2	1	20	RM 235 FRIDGE
--	--	--	3				2250	1800				4	1	20	RM 233-235 REC
CIRC-2	20	1	5						60	1800		6	1	20	RM 233-235 REC
RM 217,218,223,229-23...	20	1	7		1440	1620						8	1	20	RM 233-235 REC
RM 217,218,223,229-23...	20	1	9				1260	1080				10	1	20	RM 203, 219-222,224-2...
RM 217,218,223,229-23...	20	1	11						1260	1080		12	1	20	RM 203, 219-222,224-2...
RM 219 COPIER	20	1	13		1500	1080						14	1	20	RM 203, 219-222,224-2...
RM 219 CNTR REC GFI	20	1	15				180	900				16	1	20	LOBBY EWC
RM 219 CNTR REC GFI	20	1	17						180	1440		18	1	20	RM 212-216 REC
RM 219 FRIDGE	20	1	19		1680	1620						20	1	20	RM 212-216 REC
RM 200,208,211 REC	20	1	21				720	1620				22	1	20	RM 212-216 REC
RM 200,208,211 REC	20	1	23						900	1200		24	1	20	HDO-1,2
RM 200,208,211 REC	20	1	25		900	1500						26	1	20	MAILROOM INSERTER
MAILROOM REC	20	1	27				720	1500				28	1	20	MAILROOM COPIER
MAILROOM REC	20	1	29						540	900		30	1	20	RM 205 REC
A/P RECS	20	1	31		540	900						32	1	20	RM 205 REC
A/P RECS	20	1	33				540	900				34	1	20	RM 205 REC
A/P RECS	20	1	35						540	1800		36	1	20	RM 235 EQUIP RACK
RM 235 SHADES	20	1	37		456	1824						38	1	20	RM 235 SHADES
SPARE	20	1	39				0	0				40	1	20	SPARE
SPARE	20	1	41						0	0		42	1	20	SPARE
SPARE	20	1	43		0	0						44	1	20	SPARE
SPARE	20	1	45				0	0				46	1	20	SPARE
SPARE	20	1	47						0	0		48	1	20	SPARE
SPARE	20	1	49		0	0						50	1	20	SPARE
SPARE	20	1	51				0	0				52	1	20	SPARE
SPARE	20	1	53						0	0		54	1	20	SPARE
SPARE	20	1	55		0	0						56	1	20	SPARE
SPARE	20	1	57				0	0				58	1	20	SPARE
SPARE	20	1	59						0	0		60	1	20	SPARE
	Amps per Phase:				159 A		115 A		98 A						

LOAD	CONNECTED	DEMAND	ADJUSTED
LIGHTING			
RECEPTACLES	39.1 kVA	62.80%	24.5 kVA
HVAC	4.6 kVA	100.00%	4.6 kVA
KITCHEN			
OTHER	0.4 kVA	100.00%	0.4 kVA
		Total kVA:	29.5 kVA
		Total Amps:	81.7 A

Panel: 2H1

Volts: 480/277 Wye **Phase:** 3 **Wire:** 4
Mains Rating: 225 A **Mains Type:** MLO **Mounting:** Surface
EATON POW-R-LINE SERIES

Notes: FACTORY INSTALLED 160KA SPD,

DESCRIPTION	CKT	BRK	CKT #	GF CI	A		B		C		GF CI	CKT #	CKT	BRK	DESCRIPTION
RM 223-235 LTG	20	1	1		1719	2141						2	1	20	RM 205-219 LTG
HP-18	20	1	3				2770	3601				4	1	20	HP-42
HP-19	20	1	5						3324	4986		6	1	25	HP-24
HP-20	20	1	7		3324	2105						8	3	20	SECURITY GATE SG-1
HP-21	20	1	9				3324	2105				10	--	--	--
HP-47	20	1	11						3601	2105		12	--	--	--
HP-22	20	1	13		3324	3324						14	1	20	HP-46
SPARE	20	3	15				0	0				16	1	20	SPARE
--	--	--	17						0	0		18	1	20	SPARE
--	--	--	19		0	3075						20	3	20	HP-48
VEST 200 ELEC HTR	20	1	21				2000	3075				22	--	--	--
HP-41	25	1	23						4986	3075		24	--	--	--
SPARE	20	1	25		0	0						26	1	20	SPARE
SPARE	20	1	27				0	0				28	1	20	SPARE
SPARE	20	1	29						0	0		30	1	20	SPARE
SPARE	20	1	31		0	0						32	1	20	SPARE
SPARE	20	1	33				0	0				34	1	20	SPARE
SPARE	20	1	35						0	0		36	1	20	SPARE
XFMR T4	100	3	37		18810	0						38	--	--	--
--	--	--	39				13470	0				40	--	--	--
--	--	--	41						11700	0		42	--	--	--
	Amps per Phase:				138 A		110 A		124 A						

LOAD	CONNECTED	DEMAND	ADJUSTED
LIGHTING	3.8 kVA	125.00%	4.8 kVA
RECEPTACLES	45.4 kVA	61.02%	27.7 kVA
HVAC	52.3 kVA	100.00%	52.3 kVA
KITCHEN			
OTHER	0.4 kVA	100.00%	0.4 kVA
		Total kVA:	85.2 kVA
		Total Amps:	102.5 A

Panel: 2H2

Volts: 480/277 Wye **Phase:** 3 **Wire:** 4
Mains Rating: 225 A **Mains Type:** MLO **Mounting:** Surface
EATON POW-R-LINE SERIES

Notes: FACTORY INSTALLED 160kA SPD

DESCRIPTION	CKT	BRK	CKT #.	GF CI	A		B		C		GF CI	CKT #	CKT	BRK	DESCRIPTION
HP-43	20	3	1		3684	3684						2	3	20	HP-44
--	--	--	3				3684	3684				4	--	--	--
--	--	--	5						3684	3684		6	--	--	--
SPARE	20	3	7		0	1385						8	1	20	HP-13
--	--	--	9				0	2770				10	1	20	HP-15
--	--	--	11						0	2770		12	1	20	HP-16
HP-14	20	1	13		1385	3324						14	1	20	HP-68
HP-25	20	1	15				3601	2868				16	1	20	LOBBY & ASSESOR LTG
RM 236-245 LTG	20	1	17						1657	3140		18	1	20	COUNCIL CHAMBER LTG
HP-45	25	1	19		4986	0						20	1	20	SPARE
SPARE	20	1	21				0	0				22	1	20	SPARE
SPARE	20	1	23						0	0		24	1	20	SPARE
SPARE	20	1	25		0	0						26	1	20	SPARE
SPARE	20	1	27				0	0				28	1	20	SPARE
SPARE	20	1	29						0	0		30	1	20	SPARE
SPARE	20	1	31		0	0						32	1	20	SPARE
SPARE	20	1	33				0	0				34	1	20	SPARE
SPARE	20	1	35						0	0		36	1	20	SPARE
--	--	--	37		0	0						38	--	--	--
--	--	--	39				0	0				40	--	--	--
--	--	--	41						0	0		42	--	--	--
	Amps per Phase:				68 A		61 A		54 A						

LOAD	CONNECTED	DEMAND	ADJUSTED
LIGHTING	3.4 kVA	125.00%	4.2 kVA
RECEPTACLES			
HVAC	42.3 kVA	100.00%	42.3 kVA
KITCHEN			
OTHER	4.3 kVA	100.00%	4.3 kVA
		Total kVA:	50.8 kVA
		Total Amps:	61.1 A

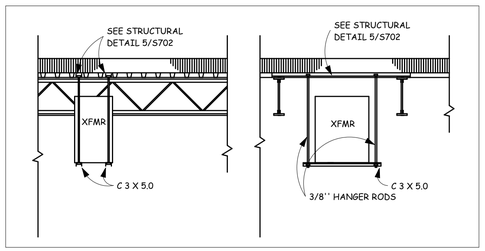
Panel: 3H1

Volts: 480/277 Wye **Phase:** 3 **Wire:** 4
Mains Rating: 225 A **Mains Type:** MLO **Mounting:** Recessed
EATON POW-R-LINE SERIES

Notes: FACTORY INSTALLED 160KA SPD,

DESCRIPTION	CKT	BRK	CKT #.	GF CI	A		B		C		GF CI	CKT #.	CKT	BRK	DESCRIPTION
HP-52	20	3	1		3048	0						2	3	20	SPARE
--	--	--	3				3048	0				4	--	--	--
--	--	--	5						3048	0		6	--	--	--
HP-28	20	1	7		1385	2105						8	3	20	SECURITY GATE SG-2
HP-53	20	1	9				1662	2105				10	--	--	--
HP-54	20	1	11						3324	2105		12	--	--	--
HP-55	20	1	13		1662	2770						14	1	20	HP-31
HP-27	20	1	15				1385	3324				16	1	20	HP-34
HP-30	20	1	17						2770	1065		18	1	20	W. LOBBY LTG
HP-67	20	1	19		3324	2350						20	1	20	RM 306-311, 316-325 LTG
HP-26	20	1	21				1385	3601				22	1	20	HP-56
HP-33	20	1	23						3324	0		24	1	20	SPARE
HP-49	20	1	25		3601	0						26	1	20	SPARE
rm 304,305,312,315 ltg	20	1	27				1861	0				28	1	20	SPARE
SPARE	20	1	29						0	0		30	1	20	SPARE
SPARE	20	1	31		0	0						32	1	20	SPARE
SPARE	20	1	33				0	0				34	1	20	SPARE
SPARE	20	1	35						0	0		36	1	20	SPARE
--	--	--	37		0	0						38	--	--	--
--	--	--	39				0	0				40	--	--	--
--	--	--	41						0	0		42	--	--	--
	Amps per Phase:				75 A		68 A		56 A						

LOAD	CONNECTED	DEMAND	ADJUSTED
LIGHTING	4.0 kVA	125.00%	5.0 kVA
RECEPTACLES	6.3 kVA	100.00%	6.3 kVA
HVAC	42.7 kVA	100.00%	42.7 kVA
KITCHEN			
OTHER	1.3 kVA	100.00%	1.3 kVA
		Total kVA:	55.3 kVA
		Total Amps:	66.5 A



1 / E108 TRANSFORMER SUPPORT
NTS

2

This document was originally issued and sealed by Jason L. Hunze registration number 4879, on November 18, 2021 and is stored at the office of Prairie Engineering, P.C.

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REVISION SCHEDULE

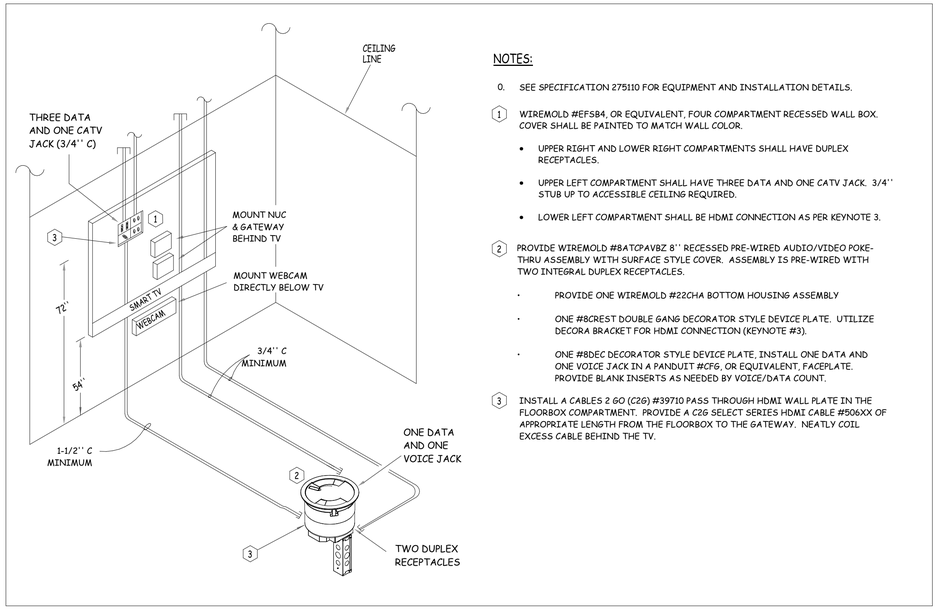
NO.	DESCRIPTION	DATE
2	Addendum #2	11/18/21

CITY OF MINOT
MINOT CITY HALL RENOVATION
MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21018

SHEET **E108**
PANEL SCHEDULES

11/17/2021 2:35:01 PM



NOTES:

0. SEE SPECIFICATION 275110 FOR EQUIPMENT AND INSTALLATION DETAILS.

1. WIREMOLD #EFSB4, OR EQUIVALENT, FOUR COMPARTMENT RECESSED WALL BOX. COVER SHALL BE PAINTED TO MATCH WALL COLOR.
   - UPPER RIGHT AND LOWER RIGHT COMPARTMENTS SHALL HAVE DUPLEX RECEPTACLES.
   - UPPER LEFT COMPARTMENT SHALL HAVE THREE DATA AND ONE CATV JACK. 3/4'' STUB UP TO ACCESSIBLE CEILING REQUIRED.
   - LOWER LEFT COMPARTMENT SHALL BE HDMI CONNECTION AS PER KEYNOTE 3.

2. PROVIDE WIREMOLD #8ATCPAVBZ 8'' RECESSED PRE-WIRED AUDIO/VIDEO POKE-THRU ASSEMBLY WITH SURFACE STYLE COVER. ASSEMBLY IS PRE-WIRED WITH TWO INTEGRAL DUPLEX RECEPTACLES.
   - PROVIDE ONE WIREMOLD #22CHA BOTTOM HOUSING ASSEMBLY
   - ONE #8CREST DOUBLE GANG DECORATOR STYLE DEVICE PLATE. UTILIZE DECORA BRACKET FOR HDMI CONNECTION (KEYNOTE #3).
   - ONE #8DEC DECORATOR STYLE DEVICE PLATE, INSTALL ONE DATA AND ONE VOICE JACK IN A PANDUIT #CFG, OR EQUIVALENT, FACEPLATE. PROVIDE BLANK INSERTS AS NEEDED BY VOICE/DATA COUNT.

3. INSTALL A CABLES 2 GO (C2G) #39710 PASS THROUGH HDMI WALL PLATE IN THE FLOORBOX COMPARTMENT. PROVIDE A C2G SELECT SERIES HDMI CABLE #506XX OF APPROPRIATE LENGTH FROM THE FLOORBOX TO THE GATEWAY. NEATLY COIL EXCESS CABLE BEHIND THE TV.

2 E109 MULTI MEDIA WEBCAM - POKE THRU 1TV
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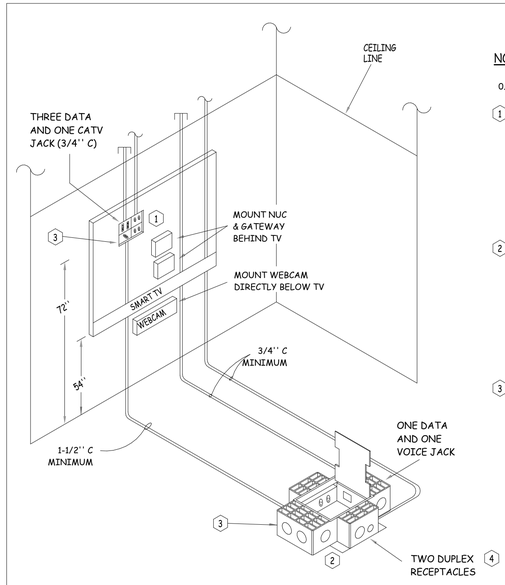


NOTES:

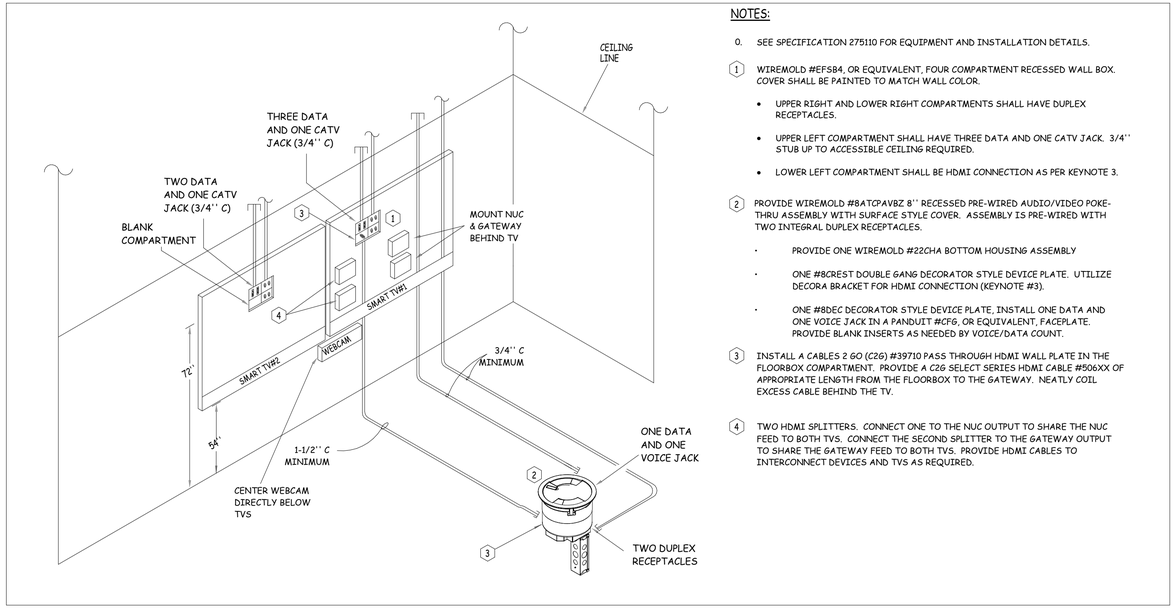
0. SEE SPECIFICATION 275110 FOR EQUIPMENT AND INSTALLATION DETAILS.

1. WIREMOLD #EFSB4, OR EQUIVALENT, FOUR COMPARTMENT RECESSED WALL BOX. COVER SHALL BE PAINTED TO MATCH WALL COLOR.
   - UPPER RIGHT AND LOWER RIGHT COMPARTMENTS SHALL HAVE DUPLEX RECEPTACLES.
   - UPPER LEFT COMPARTMENT SHALL HAVE THREE DATA AND ONE CATV JACK. 3/4'' STUB UP TO ACCESSIBLE CEILING REQUIRED.
   - LOWER LEFT COMPARTMENT SHALL BE HDMI CONNECTION AS PER KEYNOTE 3.

2. WIREMOLD #RFB4, OR EQUIVALENT, FOUR-COMPARTMENT FLOORBOX WITH #FPCTC SERIES FLANGED COVER ASSEMBLY. INCLUDE THREE DUPLEX BRACKETS AND ONE DECORA BRACKET.
   - PROVIDE DUPLEX RECEPTACLES IN TWO COMPARTMENTS (INTERNAL TUNNEL).
   - PROVIDE ONE PANDUIT #CF1064 MINI-COM 106 DUPLEX MODULE FRAME WHICH ACCEPTS UP TO FOUR MINI-COM MODULES. INSTALL ONE DATA AND ONE VOICE JACK. PROVIDE BLANK INSERTS AS NEEDED BY VOICE/DATA COUNT.
   - UTILIZE DECORA BRACKET FOR THE HDMI CONNECTION (KEYNOTE 3).

3. INSTALL A CABLES 2 GO (C2G) #39710 PASS THROUGH HDMI WALL PLATE IN THE FLOORBOX COMPARTMENT. PROVIDE A C2G SELECT SERIES HDMI CABLE #506XX OF APPROPRIATE LENGTH FROM THE FLOORBOX TO THE GATEWAY. NEATLY COIL EXCESS CABLE BEHIND THE TV.

1 E109 ROOM 132 MULTI MEDIA WEBCAM
NTS



NOTES:

0. SEE SPECIFICATION 275110 FOR EQUIPMENT AND INSTALLATION DETAILS.

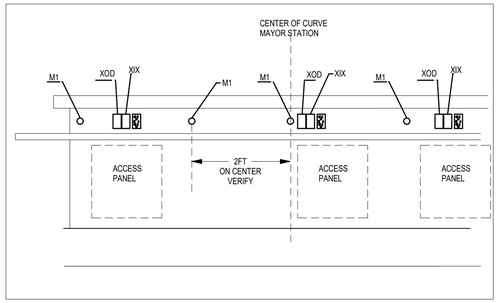
1. WIREMOLD #EFSB4, OR EQUIVALENT, FOUR COMPARTMENT RECESSED WALL BOX. COVER SHALL BE PAINTED TO MATCH WALL COLOR.
   - UPPER RIGHT AND LOWER RIGHT COMPARTMENTS SHALL HAVE DUPLEX RECEPTACLES.
   - UPPER LEFT COMPARTMENT SHALL HAVE THREE DATA AND ONE CATV JACK. 3/4'' STUB UP TO ACCESSIBLE CEILING REQUIRED.
   - LOWER LEFT COMPARTMENT SHALL BE HDMI CONNECTION AS PER KEYNOTE 3.

2. PROVIDE WIREMOLD #8ATCPAVBZ 8'' RECESSED PRE-WIRED AUDIO/VIDEO POKE-THRU ASSEMBLY WITH SURFACE STYLE COVER. ASSEMBLY IS PRE-WIRED WITH TWO INTEGRAL DUPLEX RECEPTACLES.
   - PROVIDE ONE WIREMOLD #22CHA BOTTOM HOUSING ASSEMBLY
   - ONE #8CREST DOUBLE GANG DECORATOR STYLE DEVICE PLATE. UTILIZE DECORA BRACKET FOR HDMI CONNECTION (KEYNOTE #3).
   - ONE #8DEC DECORATOR STYLE DEVICE PLATE, INSTALL ONE DATA AND ONE VOICE JACK IN A PANDUIT #CFG, OR EQUIVALENT, FACEPLATE. PROVIDE BLANK INSERTS AS NEEDED BY VOICE/DATA COUNT.

3. INSTALL A CABLES 2 GO (C2G) #39710 PASS THROUGH HDMI WALL PLATE IN THE FLOORBOX COMPARTMENT. PROVIDE A C2G SELECT SERIES HDMI CABLE #506XX OF APPROPRIATE LENGTH FROM THE FLOORBOX TO THE GATEWAY. NEATLY COIL EXCESS CABLE BEHIND THE TV.

4. TWO HDMI SPLITTERS. CONNECT ONE TO THE NUC OUTPUT TO SHARE THE NUC FEED TO BOTH TVS. CONNECT THE SECOND SPLITTER TO THE GATEWAY OUTPUT TO SHARE THE GATEWAY FEED TO BOTH TVS. PROVIDE HDMI CABLES TO INTERCONNECT DEVICES AND TVS AS REQUIRED.

4 E109 MULTI MEDIA WEBCAM - POKE THRU 2TVS
NTS



3 E109 DIAS DEVICE LAYOUT
NTS

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REVISION SCHEDULE

NO.	DESCRIPTION	DATE

CITY OF MINOT
MINOT CITY HALL RENOVATION
MINOT, ND

CITY PROJECT 4466
DATE: 11/04/21
PHASE: CONSTRUCTION DOCUMENTS
PROJECT: 21018
SHEET: **E109**
MULTIMEDIA DETAILS

This document was originally issued and sealed by Jason L. Hunze registration number 4879, on November 4, 2021 and is stored at the office of Prairie Engineering, P.C.

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Prairie Engineering P.C.
Professional Consulting Engineers

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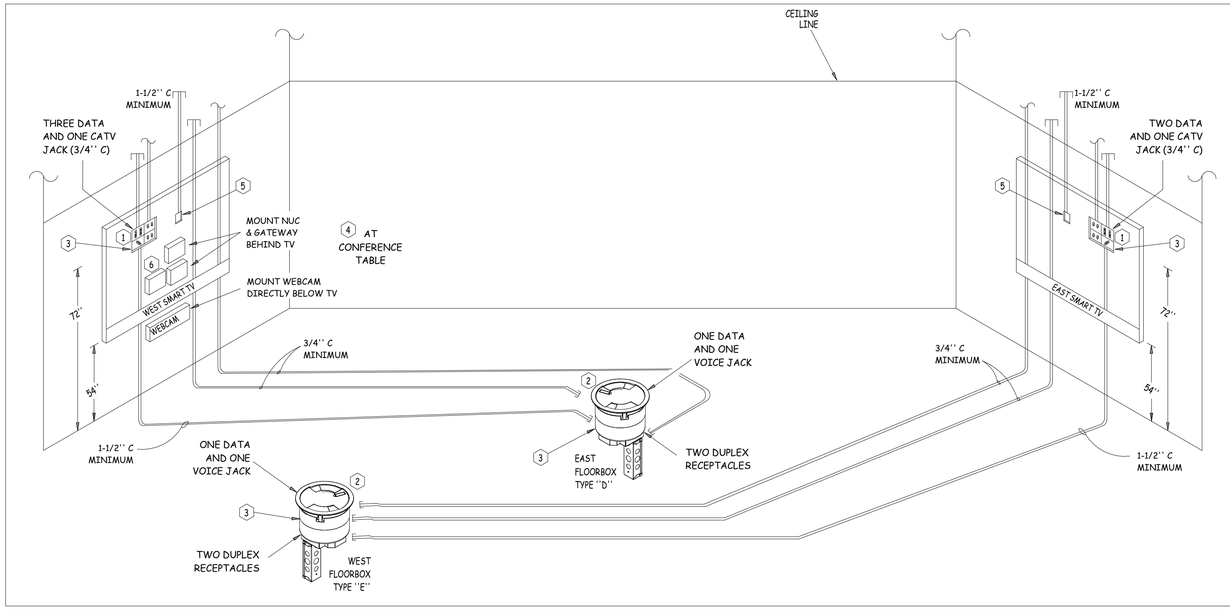


NOTES:

0. SEE SPECIFICATION 275110 FOR EQUIPMENT AND INSTALLATION DETAILS.

1. WIREMOLD #EFSB4, OR EQUIVALENT, FOUR COMPARTMENT RECESSED WALL BOX. COVER SHALL BE PAINTED TO MATCH WALL COLOR.
   - UPPER RIGHT AND LOWER RIGHT COMPARTMENTS SHALL HAVE DUPLEX RECEPTACLES.
   - UPPER LEFT COMPARTMENT SHALL HAVE THREE DATA AND ONE CATV JACK. 3/4'' STUB UP TO ACCESSIBLE CEILING REQUIRED.
   - LOWER LEFT COMPARTMENT SHALL BE HDMI CONNECTION AS PER KEYNOTE 3.

2. PROVIDE WIREMOLD #8ATCP4VBZ 8'' RECESSED PRE-WIRED AUDIO/VIDEO POKE-THRU ASSEMBLY WITH SURFACE STYLE COVER. ASSEMBLY IS PRE-WIRED WITH TWO INTEGRAL DUPLEX RECEPTACLES.
   - PROVIDE ONE WIREMOLD #22CHA BOTTOM HOUSING ASSEMBLY
   - ONE #8CREST DOUBLE GANG DECORATOR STYLE DEVICE PLATE. UTILIZE DECORA BRACKET FOR HDMI CONNECTION (KEYNOTE #3).
   - ONE #8DEC DECORATOR STYLE DEVICE PLATE, INSTALL ONE DATA AND ONE VOICE JACK IN A PANDUIT #CF6, OR EQUIVALENT, FACEPLATE. PROVIDE BLANK INSERTS AS NEEDED BY VOICE/DATA COUNT.

3. INSTALL A CABLES 2 GO (C2G) #39710 PASS THROUGH HDMI WALL PLATE IN THE FLOORBOX COMPARTMENT. PROVIDE A C2G SELECT SERIES HDMI CABLE #506XX OF APPROPRIATE LENGTH FROM THE FLOORBOX TO THE GATEWAY. NEATLY COIL EXCESS CABLE BEHIND THE TV.

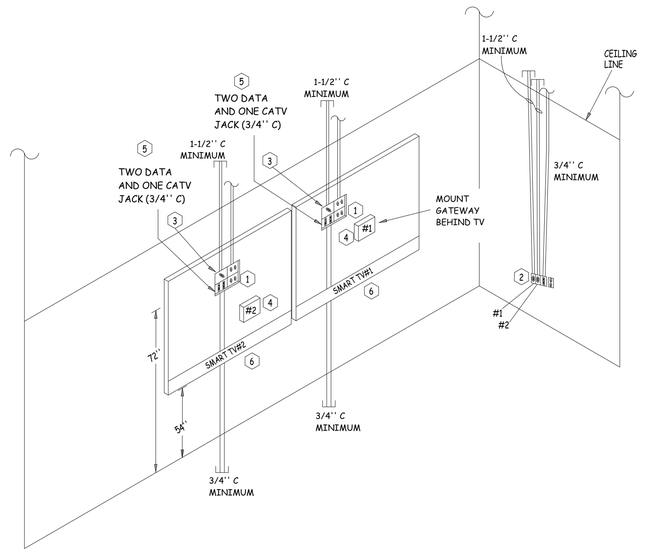
4. PROVIDE TWO TABLE TOP INTERFACE BOXES. CONNECT ONE TO EACH FLOOR BOX.

5. INSTALL A SINGLE GANG LOW VOLTAGE ROUGH-IN WITH CADDY #MP1, OR EQUIVALENT BRACKET, WITH A 1-1/2'' CONDUIT MINIMUM STUBBED ABOVE THE ACCESSIBLE CEILING FOR HDMI SPLITTER CABLE BETWEEN TV LOCATIONS. PROVIDE A LARGE GROMMET FACEPLATE C2G# 40489, OR EQUAL.

6. ONE HDMI SPLITTER. CONNECT TO THE GATEWAY OUTPUT AT THE WEST TV TO SHARE GATEWAY FEED WITH THE EAST TV. PROVIDE HDMI CABLES AS REQUIRED TO INTERCONNECT DEVICES AND TVS.

1 E110 ROOM 324 MULTI MEDIA LAYOUT

NTS



NOTES:

0. PROVIDE ALL HDMI AND CAT 6 PATCH CORDS AS REQUIRED TO INTERCONNECT EQUIPMENT AND TVS.

1. WIREMOLD #EFSB4, OR EQUIVALENT, FOUR COMPARTMENT RECESSED WALL BOX. COVER SHALL BE PAINTED TO MATCH WALL COLOR.
   - UPPER RIGHT AND LOWER RIGHT COMPARTMENTS SHALL HAVE DUPLEX RECEPTACLES.
   - LOWER LEFT COMPARTMENT SHALL HAVE THREE DATA AND ONE CATV JACK. 3/4'' STUB DOWN TO ACCESSIBLE CEILING AS REQUIRED.
   - UPPER LEFT COMPARTMENT SHALL BE HDMI CONNECTION AS PER KEYNOTE 3. STUB UP CONDUIT TO ACCESSIBLE CEILING AS REQUIRED.

2. PROVIDE A THREE GANG LOW VOLTAGE ROUGH-IN FOR DATA AND HDMI CABLING.
   - PROVIDE TWO CABLES 2 GO (C2G) #39710 PASS THROUGH HDMI WALL PLATES WITH C2G SELECT SERIES HDMI CABLES #506XX OF APPROPRIATE LENGTH FROM WALL ROUGH-IN TO EACH TV WALL BOX. NEATLY COIL EXCESS ABOVE THE ACCESSIBLE CEILING.
   - TWO DATA JACKS WITH FACEPLATE. SEE SPECIFICATION 271500.

3. INSTALL A CABLES 2 GO (C2G) #39710 PASS THROUGH HDMI WALL PLATE IN THE WALLBOX COMPARTMENT. PROVIDE A C2G SELECT SERIES HDMI CABLE #506XX OF APPROPRIATE LENGTH FROM THE WALLBOX TO THE SPLITTER. NEATLY COIL EXCESS CABLE BEHIND THE TV.

4. PROVIDE EXTRON MODEL# SHARELINK PRO 1100 PRESENTATION GATEWAY.
   - CONNECT HDMI WALL JACK #1 TO GATEWAY BEHIND TV#1. CONNECT THE GATEWAY OUTPUT TO TV#1 INPUT.
   - CONNECT HDMI WALL JACK #2 TO GATEWAY BEHIND TV#2. CONNECT THE GATEWAY OUTPUT TO TV#2 INPUT.

5. ONE DATA JACK BEHIND THE TVS WILL PROVIDE SMART TV INTERNECT ACCESS. THE SECOND DATA JACK WILL PROVIDE INTERNET ACCESS TO THE GATEWAY.

6. 75-INCH CLASS 4K UHD LED SMART TV WITH INTEGRAL LAN AND HDMI PORTS, AND ADJUSTABLE WALL MOUNT BRACKET PROVIDED AND INSTALLED BY E.C.

2 E110 ROOM 315 MULTI MEDIA LAYOUT

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SHEET
E110
MULTIMEDIA DETAILS

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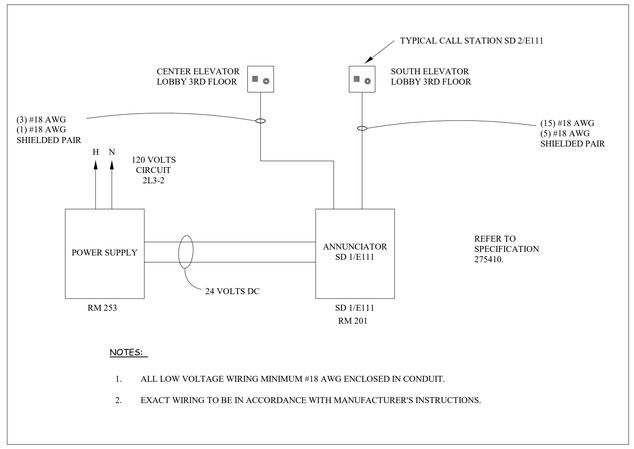
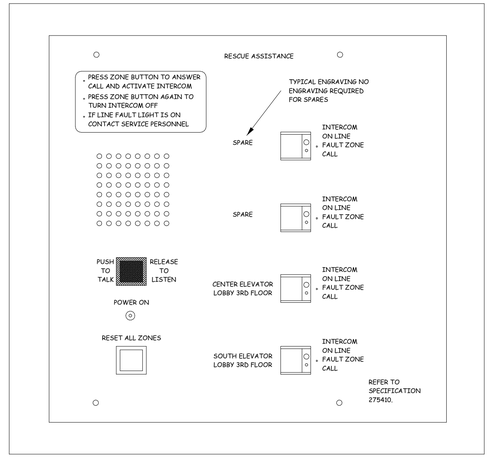
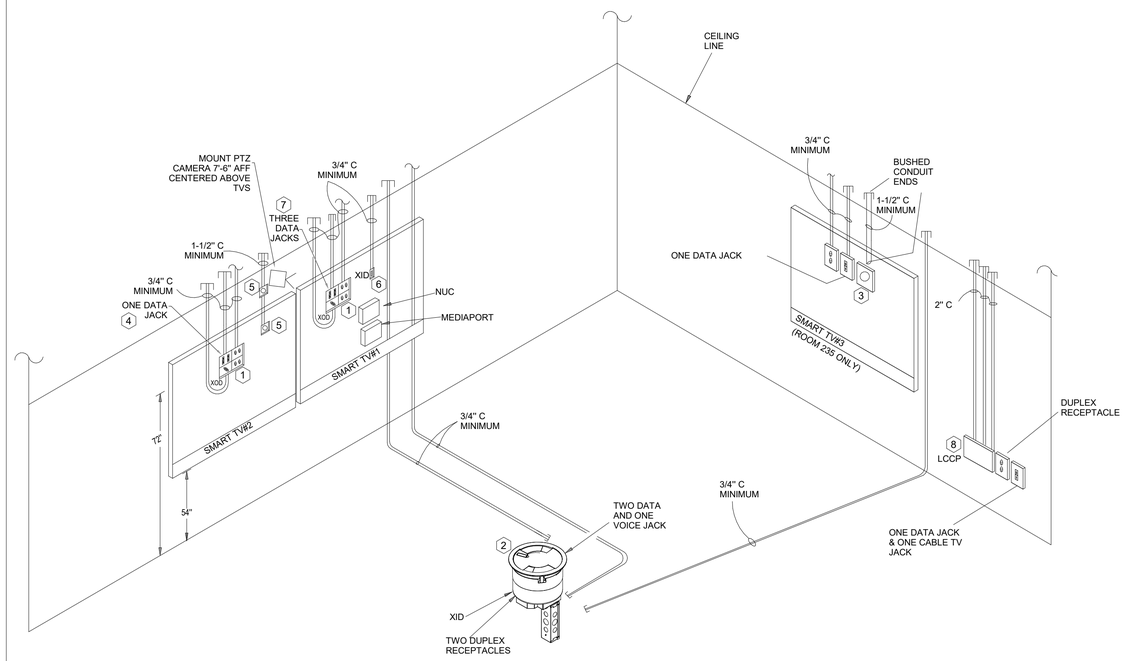
2 E111 RESCUE ASSIST CALL STATION
NTS



3 E111 RESCUE ASSIST RISER
NTS



1 E111 RESCUE ASSIST ANNUNCIATOR
NTS



4 E111 LARGE MULTI MEDIA WEBCAM - POKE THRU
NTS

NOTES:

0. SEE SPECIFICATION 275111 FOR EQUIPMENT AND INSTALLATION DETAILS.

1. WIREMOLD #EFSB4, OR EQUIVALENT, FOUR-COMPARTMENT RECESSED WALL BOX. COVER SHALL BE PAINTED TO MATCH WALL COLOR.
   - UPPER RIGHT AND LOWER RIGHT COMPARTMENTS SHALL HAVE DUPLEX RECEPTACLES.
   - UPPER LEFT COMPARTMENT SHALL HAVE VOICE/DATA JACKS AS NOTED AND 3/4" STUB UP TO ACCESSIBLE CEILING.
   - LOWER LEFT COMPARTMENT SHALL BE XOD JACK. INSTALL SHIELDED CABLE AS RECOMMENDED BY MANUFACTURER BETWEEN DEVICE AND LCCP VIDEO PROCESSOR.

2. PROVIDE WIREMOLD #8ATCPAVBZ 8" RECESSED PRE-WIRED AUDIO/VIDEO POKE-THRU ASSEMBLY WITH SURFACE STYLE COVER. ASSEMBLY IS PRE-WIRED WITH TWO INTEGRAL DUPLEX RECEPTACLES.
   - PROVIDE ONE WIREMOLD #22CHA BOTTOM HOUSING ASSEMBLY.
   - PROVIDE ONE WIREMOLD #8CREST DECORA STYLE DEVICE PLATE. INSTALL THE XID DEVICE IN THIS PLATE. INSTALL SHIELDED CABLE AS RECOMMENDED BY MANUFACTURER BETWEEN FLOOR BOX AND LCCP VIDEO PROCESSOR.
   - PROVIDE ONE WIREMOLD #8DEC DECORA STYLE DEVICE PLATE, INSTALL TWO DATA AND ONE VOICE JACK IN A PANDUIT #CFG, OR EQUIVALENT, FACEPLATE.
     - ONE DATA JACK WILL TERMINATE IN THE LCCP POE SWITCH FOR THE TABLETOP CONTROLLER.
     - THE OTHER DATA JACK AND VOICE JACK WILL TERMINATE IN DTR1.
     - PROVIDE ADDITIONAL BLANK INSERTS AS REQUIRED TO FILL FACEPLATE FOR VOICE/DATA COUNT.

3. SINGLE-GANG OPENING IN THE WALL WITH CADDY #MP1, OR EQUIVALENT, LOW VOLTAGE MOUNTING BRACKET WITH LARGE GROMMET FACEPLATE C2G MODEL# 40489 OR EQUAL.
   - PROVIDE A C2G SELECT SERIES HDMI CABLE #506XX OF APPROPRIATE LENGTH FROM LCCP TO TV. LEAVE AT LEAST A 3' SERVICE LOOP IN THE HDMI CABLE SO IT CAN BE CONNECTED DIRECTLY TO TV. COIL EXTRA CABLE NEATLY ABOVE THE ACCESSIBLE CEILING.

4. AT TV#2 THE SINGLE DATA JACK WILL TERMINATE IN DTR1 FOR SMART TV INTERNET ACCESS.

5. TWO-GANG OPENING IN THE WALL WITH CADDY #MP2, OR EQUIVALENT, LOW VOLTAGE MOUNTING BRACKET WITH LARGE GROMMET FACEPLATE, CABLES 2 GO (C2G) #40546 OR EQUAL. ALIGN UPPER OPENING DIRECTLY BEHIND THE PTZ CAMERA.
   - PROVIDE A C2G SELECT SERIES HDMI CABLE #506XX OF APPROPRIATE LENGTH FROM PTZ CAMERA TO EXTRON MEDIAPORT HDMI INPUT BEHIND TV.
   - PROVIDE RS-232 CONTROL CABLING BETWEEN LCCP AND PTZ CAMERA FOR CONTROLS.
   - PROVIDE AUDIO CABLING BETWEEN THE SHURE ANIUSB IN LCCP AND THE MEDIAPORT FOR MICROPHONE AUDIO.

6. CONNECT NUC HDMI OUTPUT TO XID DEVICE FOR DISTRIBTUION TO THE TVS VIA THE LCCP VIDEO PROCESSOR.

7. AT TV#1 THE DATA JACKS WILL TERMINATE IN THE FOLLOWING LOCATIONS:
   - TWO DATA JACKS WILL TERMINATE IN THE LCCP POE SWITCH. ONE IS FOR THE MEDIAPORT. THE SECOND IS FOR THE NUC.
   - THE THIRD DATA JACK WILL TERMINATE IN DTR1 FOR SMART TV INTERNET ACCESS.

8. MOUNT LCCP EQUIPMENT RACK IN BASE CABINET. COORDINATE ROUGH-IN REQUIREMENTS WITH G.C. AND CABINETRY SUPPLIER.

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PHASE CONSTRUCTION DOCUMENTS
PROJECT 21018
SHEET E111
ELECTRICAL DETAILS

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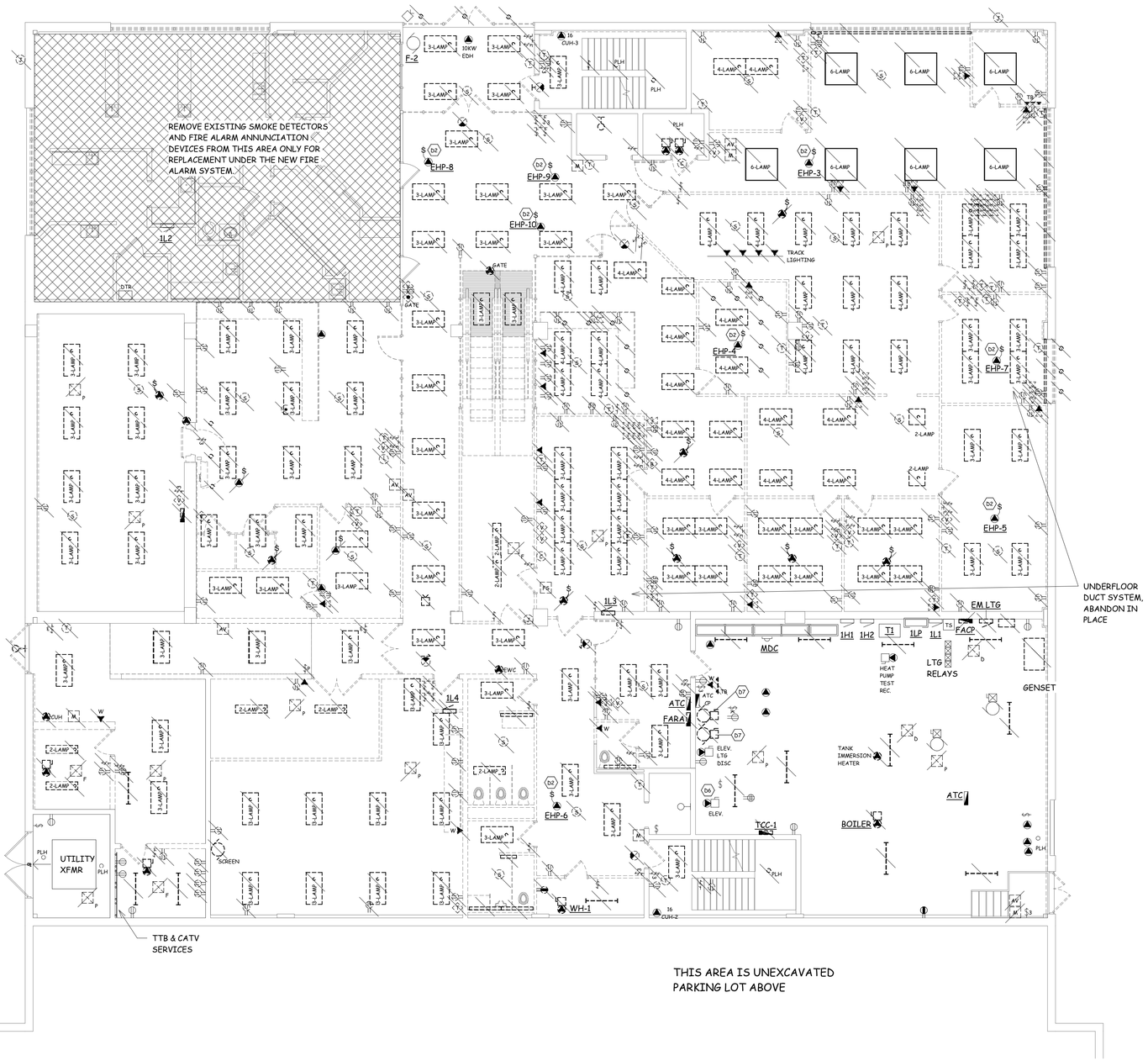

Keynote Legend	
Key Value	Keynote Text
D2	DISCONNECT EXISTING HEAT PUMP FOR RELOCATION AS SHOWN ON SHEET E400. REUSE EXISTING DISCONNECT AT NEW LOCATION.
D6	DISCONNECT EXISTING ELEVATOR CONTROLLER FOR NEW CONTROLLER INSTALLATION.
D7	DISCONNECT POWER TO EXISTING BUILDING LOOP PUMPS AND RECONNECT TO NEW AS SHOWN ON DETAIL 1/E400. EXISTING FDS TO BE ELIMINATED.

GENERAL NOTES

1. FIELD VERIFY ALL PERTINENT EXISTING CONDITIONS AND INSTALLATION REQUIREMENTS IN CONNECTION WITH REMODEL. MAKE ALLOWANCES IN BID THERETO.
2. DEVICES WITH SLASH THROUGH INDICATE SPECIFIC EXISTING DEVICES TO BE REMOVED. REMOVE OR RELOCATE ANY ELECTRICAL DEVICE REQUIRED BY REMODEL OPERATIONS. EXTEND EXISTING CIRCUITRY AS REQUIRED TO MAINTAIN DOWNSTREAM DEVICES OR FIXTURES. DISCONNECT AND REMOVE ANY EXISTING CIRCUITRY NOT BEING REUSED. RE-IDENTIFY EXISTING PANEL DIRECTORIES AS REQUIRED.
3. SEE SPECIFICATION 260510 FOR REMODEL.
4. THE AREA UNDER THE RAISED FLOORING IN THE PSAP IS A HVAC PLENUM SPACE.
5. ALL CABLING IN THE EXPOSED LOBBY AREAS ON 2ND AND 3RD FLOOR SHALL BE IN CONDUIT. CONDUITS IN THE EXPOSED LOBBY SPACES WILL BE PAINTED BY G.C. TO MATCH THE CEILING FINISHES. GROUP CONDUITS TOGETHER TO MINIMIZE QUANTITIES AND CROSSING AREAS TO THE EXTENT PRACTICLE.
6. REFER TO FRONT END SPECIFICATIONS FOR BUY AMERICA ACT, FEMA, AND HUD FUNDING REQUIREMENTS FOR SUPPLIED AND INSTALLED EQUIPMENT.

1 E200 FIRST FLOOR EXISTING CONDITIONS
1/8" = 1'-0"

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FIRST FLOOR EXISTING CONDITIONS

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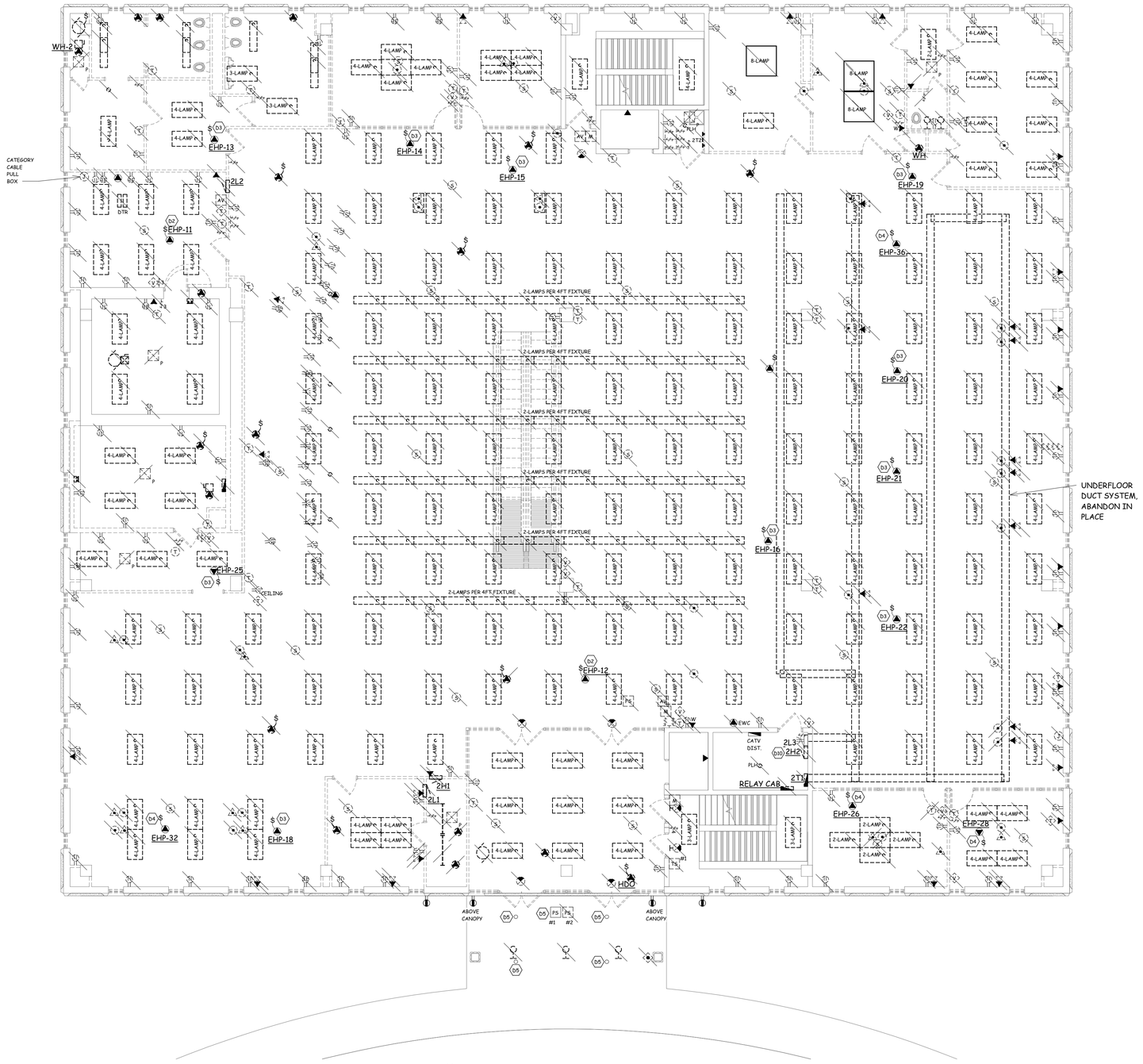

1 E201

SECOND FLOOR EXISTING CONDITIONS

1/8" = 1'-0"

Keynote Legend	
Key Value	Keynote Text
D2	DISCONNECT EXISTING HEAT PUMP FOR RELOCATION AS SHOWN ON SHEET E400. REUSE EXISTING DISCONNECT AT NEW LOCATION.
D3	DISCONNECT EXISTING HEAT PUMP FOR RELOCATION AS SHOWN ON SHEET E401. REUSE EXISTING DISCONNECT AT NEW LOCATION.
D4	DISCONNECT EXISTING HEAT PUMP FOR RELOCATION AS SHOWN ON SHEET E402. REUSE EXISTING DISCONNECT AT NEW LOCATION.
D5	UNDER BASE BID EXISTING RECESSED ENTRY LIGHTS AND PHOTO-EYE TO REMAIN. TIME SWITCH TO BE REMOVED FOR PHOTO-EYE ON/OFF CONTROL.
D10	SALVAGE BREAKERS FROM REMOVED 480V PANELS AND FILL REMAINING PANELS EMPTY SPACES WITH ''SPARES''.

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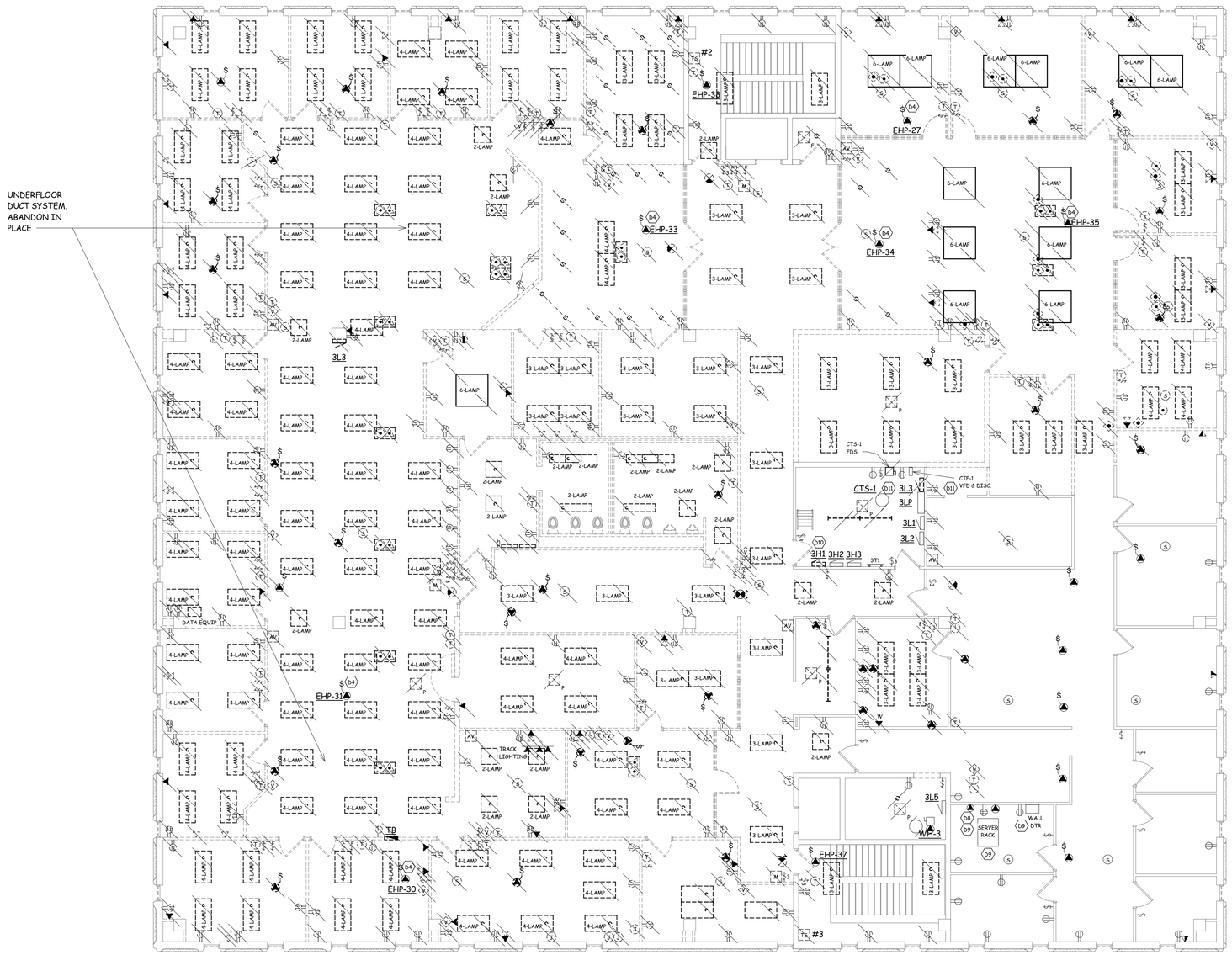
Keynote Legend	
Key Value	Keynote Text
D4	DISCONNECT EXISTING HEAT PUMP FOR RELOCATION AS SHOWN ON SHEET E402. REUSE EXISTING DISCONNECT AT NEW LOCATION.
D8	FIELD VERIFY EXISTING DATA RACK AIR CONDITIONER RECEPTACLE STYLE PRIOR TO RELOCATING TO FIRST FLOOR.
D9	FIELD COORDINATE RELOCATION OF NORTHLAND HEALTH SERVER RACK, WALL MOUNTED DATA RACK, AND RACK AIR CONDITIONING UNIT ONCE FIRST FLOOR OFFICE SPACE IS READY FOR TENANT MOVE IN.
D10	SALVAGE BREAKERS FROM REMOVED 480V PANELS AND FILL REMAINING PANELS EMPTY SPACES WITH ''SPARES''.
D11	REFEED EXISTING COOLING TOWER EQUIPMENT FROM NEW PANEL HC.



1 E202 THIRD FLOOR EXISTING CONDITIONS

1/8" = 1'-0"

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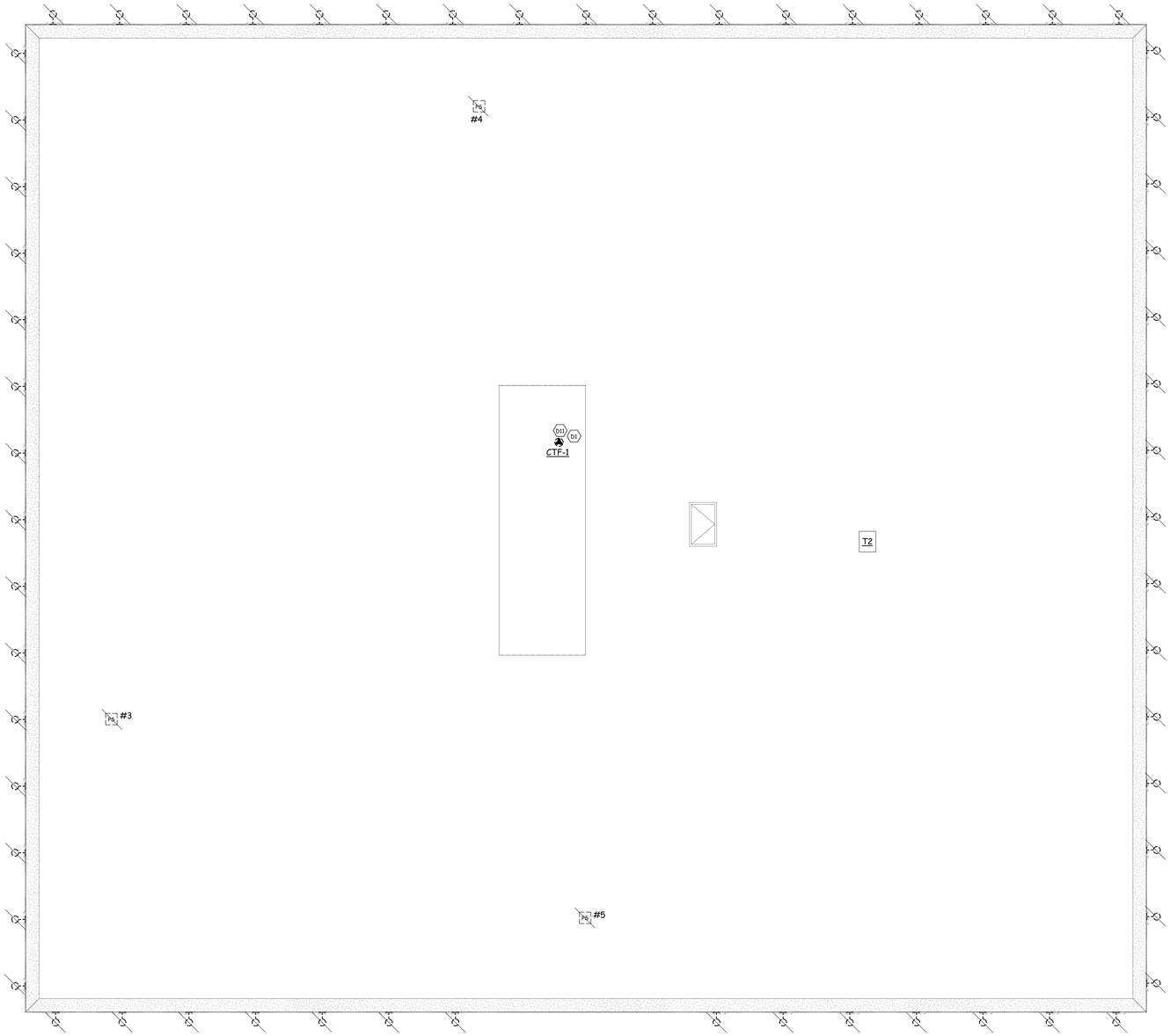
Keynote Legend	
Key Value	Keynote Text
D1	RELOCATE EXISTING COOLING TOWER AS SHOWN ON DETAIL 1/E403. EXTEND EXISTING CONDUITS TO THE NEW LOCATION.
D11	REFEED EXISTING COOLING TOWER EQUIPMENT FROM NEW PANEL HC.



1 E203 ROOF EXISTING CONDITIONS
1/8" = 1'-0"

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E203
ROOF EXISTING CONDITIONS

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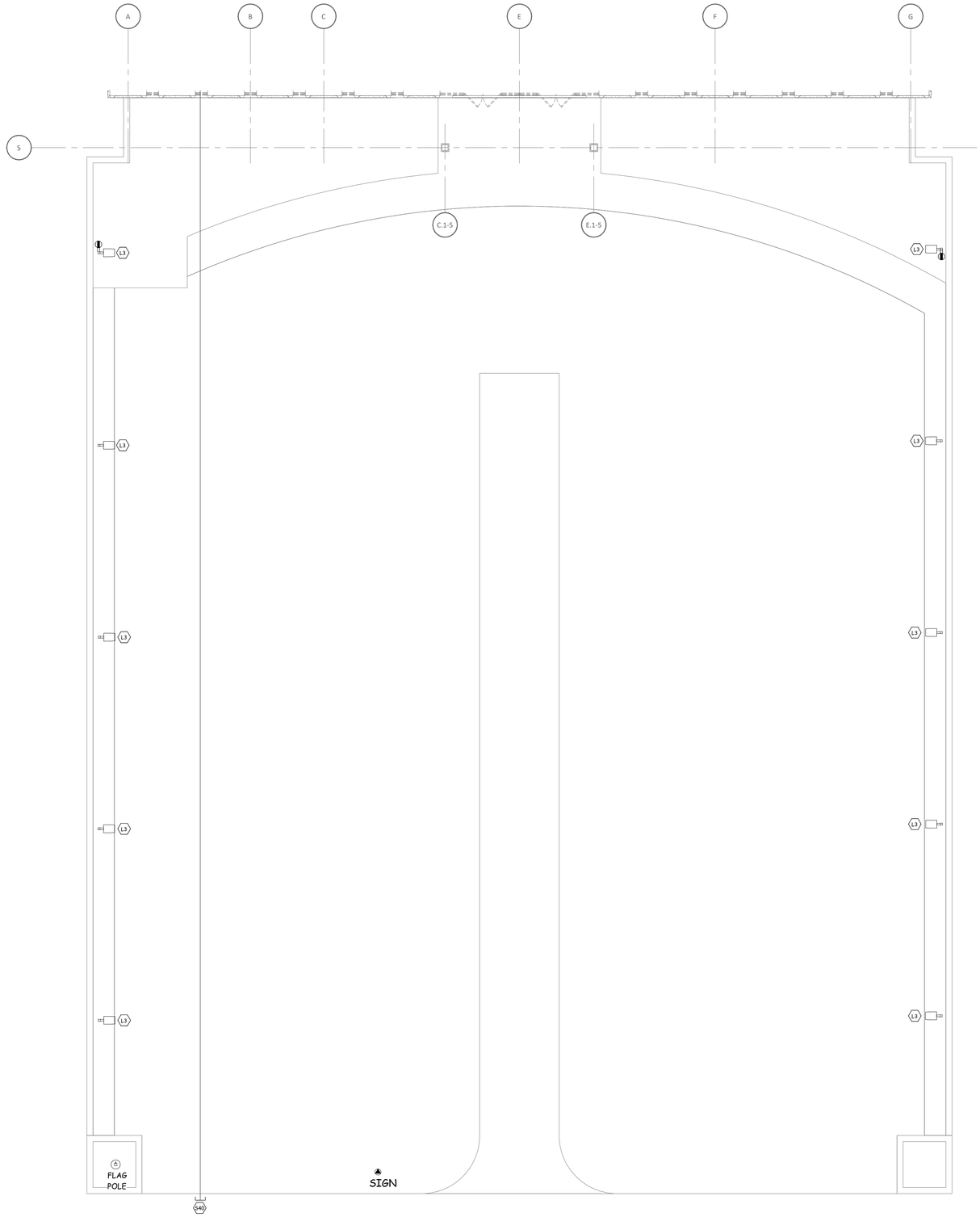

Keynote Legend	
Key Value	Keynote Text
L3	UNDER ALTERNATE #10 PROVIDE REPLACEMENT LED HEADS FOR EXISTING HID POLE MOUNTED FIXTURES AND BYPASS EXISTING LIGHTING RELAY SO FIXTURES HAVE POWER AT ALL TIMES. BASE BID EXISTING PARKING LOT FIXTURES AND CONTROLS TO REMAIN AS IS.
S40	PROVIDE AND INSTALL 2'' CONDUIT BETWEEN ROOM 112 AND THE SOUTH PROPERTY LINE FOR NEW SRT FIBER LINE. FIELD COORDINATE WITH SRT FOR CONDUIT TERMINATION POINT.

1 E204 SITE PLAN

1" = 10' -0"

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E204
SITE PLAN

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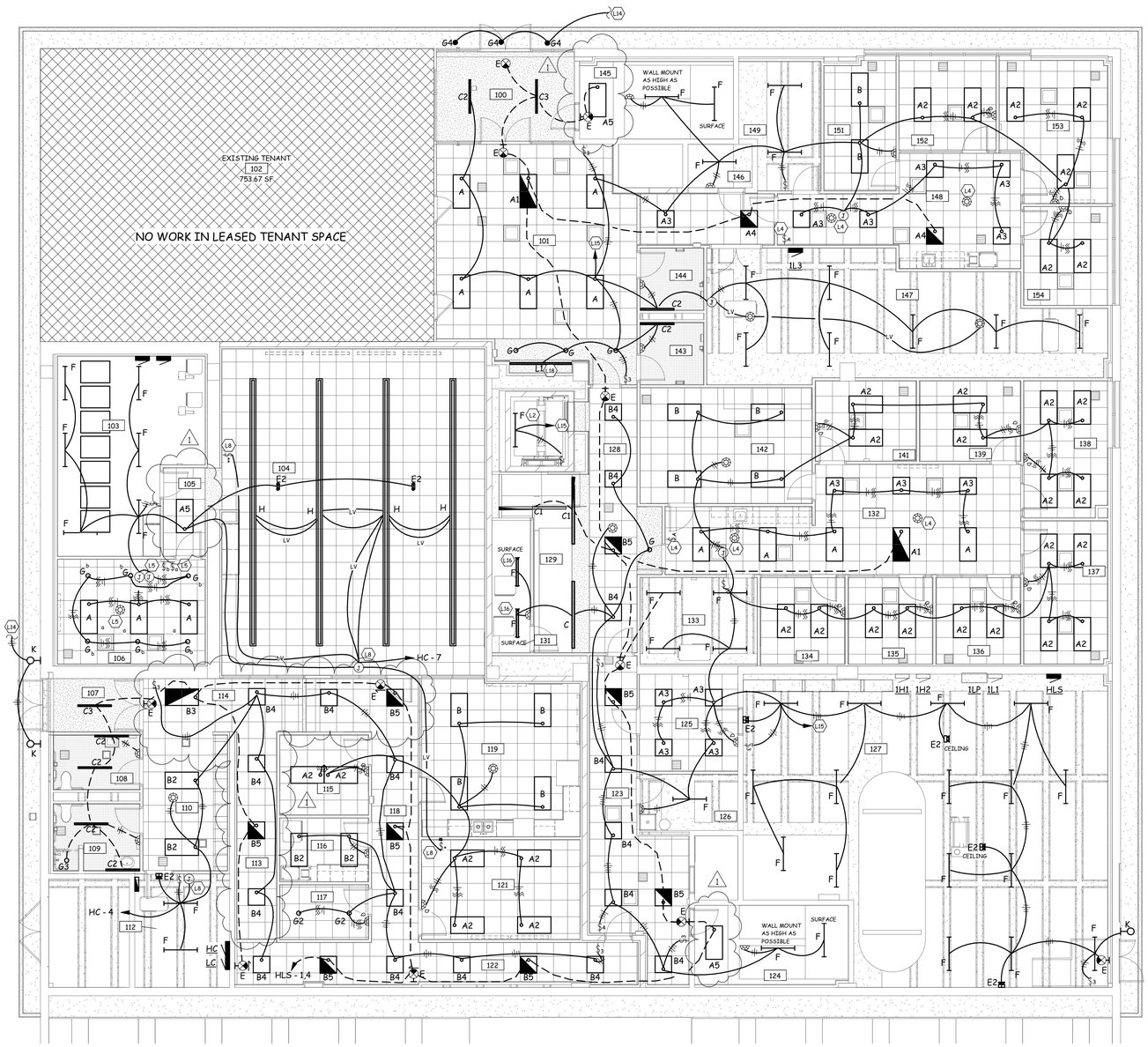

1 E300 FIRST FLOOR LIGHTING PLAN

1/8" = 1'-0"

Keynote Legend	
Key Value	Keynote Text
L2	PROVIDE WIRE GUARD FOR THIS FIXTURE. FIELD COORDINATE MOUNTING LOCATION OF FIXTURE WITH ELEVATOR SUPPLIER/INSTALLER.
L4	SD 1/E102 FOR SINGLE ZONE DIMMING CONTROL.
L5	SD 2/E102 FOR TWO ZONE DIMMING CONTROL.
L8	SD 5/E102 FOR DISPATCH LIGHTING CONTROL.
L14	RECONNECT TO EXISTING EXTERIOR LIGHTING CIRCUIT AND CONTROLS THAT FED THIS AREA.
L15	CONNECT TO EXISTING 20/1 BREAKER IN PANEL 1H1 FOR POWER.
L16	PROVIDE WIRE GUARD FOR THIS FIXTURE.
L18	FIELD COORDINATE REMOTE DRIVER INSTALLATION LOCATION WITH G.C. AND DISPLAY SUPPLIER TO ENSURE IT IS ACCESSIBLE. FIXTURES TO MOUNT AT TOP OF DISPLAY AGAINST THE FIXTURE VALANCE AND ILLUMINATE IN TO THE DISPLAY CASE.

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FIRST FLOOR LIGHTING PLAN

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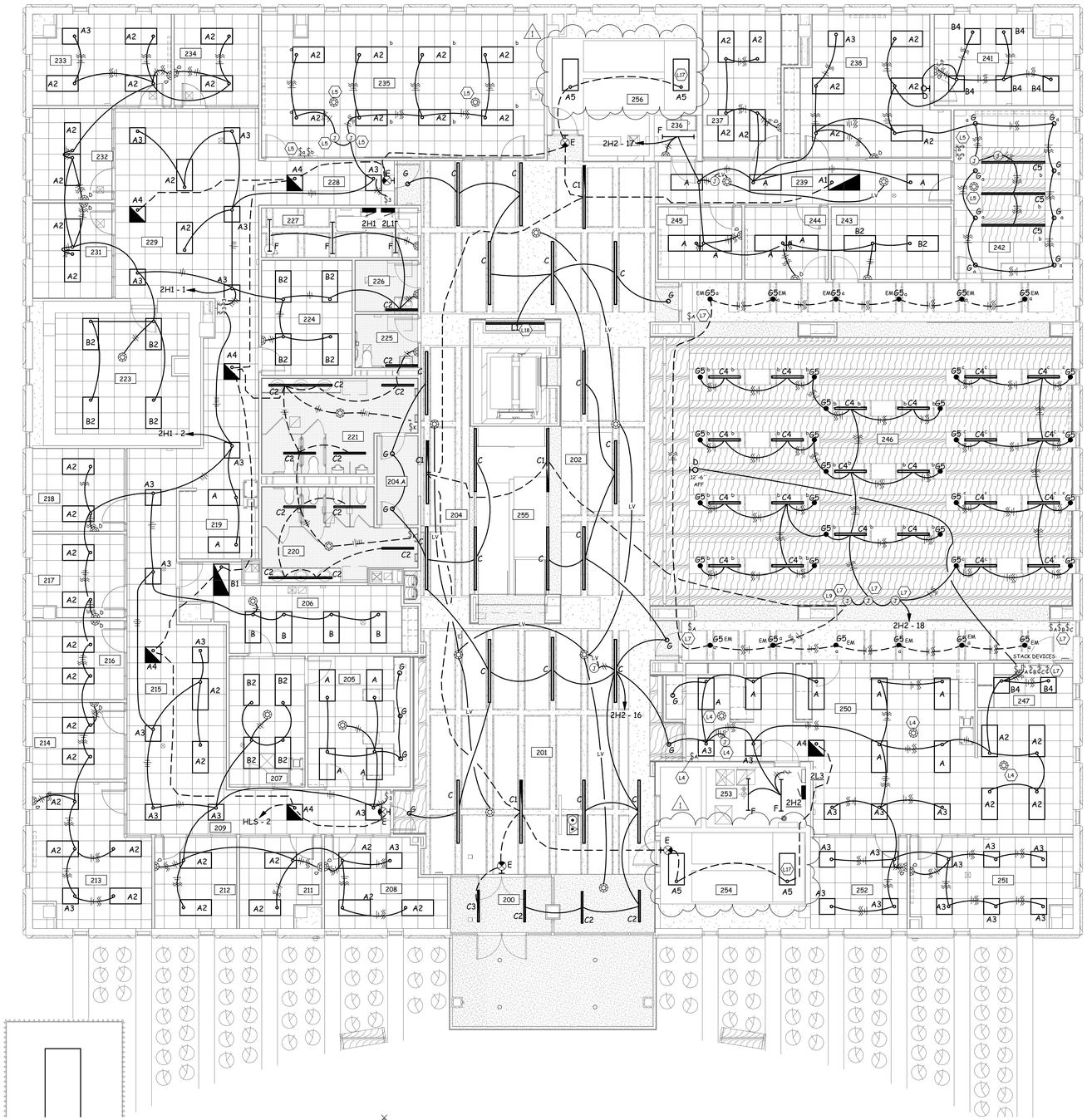
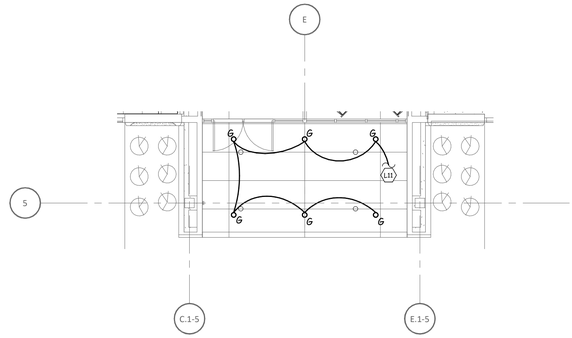


1 E301 — SECOND FLOOR LIGHTING PLAN
1/8" = 1'-0"

Keynote Legend	
Key Value	Keynote Text
L4	SD 1/E102 FOR SINGLE ZONE DIMMING CONTROL.
L5	SD 2/E102 FOR TWO ZONE DIMMING CONTROL.
L7	SD 4/E102 FOR COUNCIL CHAMBER DIMMING CONTROL.
L9	PROVIDE AND INSTALL A UL924 DIMMING OVERRIDE RELAY TO CONTROL EGRESS FIXTURES ON THIS ZONE. INSTALL THE DIMMING OVERRIDE REALY DOWN STREAM OF THE ROOM DIMMING CONTROLLER. SD 4/E100 FOR FURTHER DETAILS.
L11	UNDER ALTERNATE #3 EXISTING CANOPY LIGHTS AND PHOTO-EYE #1 ARE REMOVED. CONNECT NEW ENTRY CANOPY LIGHTS TO PARKING LOT LIGHTING CIRCUIT IN BOILER ROOM FOR POWER. ROUTE DOWNLIGHT PORTION OF CIRCUIT THROUGH EXISTING PARKING LOT CONTACTOR FOR ON/OFF CONTROL VIA EXISTING ROOF LIGHTING TIME CLOCK.
L17	PROVIDE SURFACE MOUNT FRAME KIT FOR THIS FIXTURE AT THE 1ST FLOOR INTERMEDIATE LANDING.
L18	FIELD COORDINATE REMOTE DRIVER INSTALLATION LOCATION WITH G.C. AND DISPLAY SUPPLIER TO ENSURE IT IS ACCESSIBLE. FIXTURES TO MOUNT AT TOP OF DISPLAY AGAINST THE FIXTURE VALANCE AND ILLUMINATE IN TO THE DISPLAY CASE.



2 E301 — ALTERNATE #3 ELECTRICAL
1/8" = 1'-0"

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SECOND FLOOR LIGHITNG PLAN

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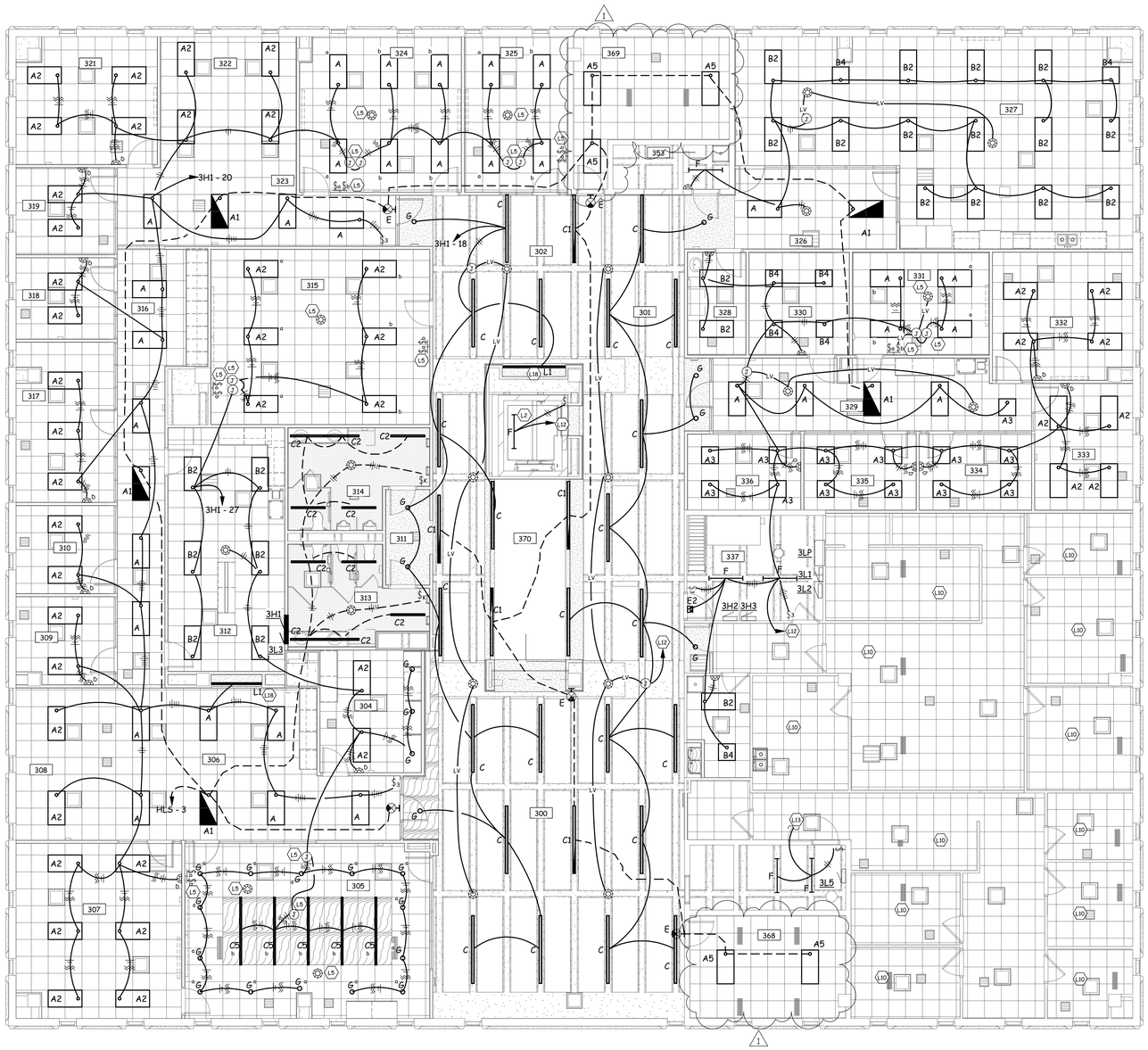

THIRD FLOOR LIGHTING PLAN

1/8" = 1'-0"

Keynote Legend	
Key Value	Keynote Text
L2	PROVIDE WIRE GUARD FOR THIS FIXTURE. FIELD COORDINATE MOUNTING LOCATION OF FIXTURE WITH ELEVATOR SUPPLIER/INSTALLER.
L5	SD 2/E102 FOR TWO ZONE DIMMING CONTROL.
L10	EXTEND EXISTING SHELL SPACE LIGHTING CIRCUITS TO UNUSED 20/1 BREAKERS IN PANELS 3H2 AND 3H3 FOR POWER.
L12	CONNECT TO SPARE 20/1 BREAKER IN PANEL 3H2 FOR POWER.
L13	CONNECT TO SHELL SPACE LIGHTING CIRCUIT FOR POWER.
L18	FIELD COORDINATE REMOTE DRIVER INSTALLATION LOCATION WITH G.C. AND DISPLAY SUPPLIER TO ENSURE IT IS ACCESSIBLE. FIXTURES TO MOUNT AT TOP OF DISPLAY AGAINST THE FIXTURE VALANCE AND ILLUMINATE IN TO THE DISPLAY CASE.

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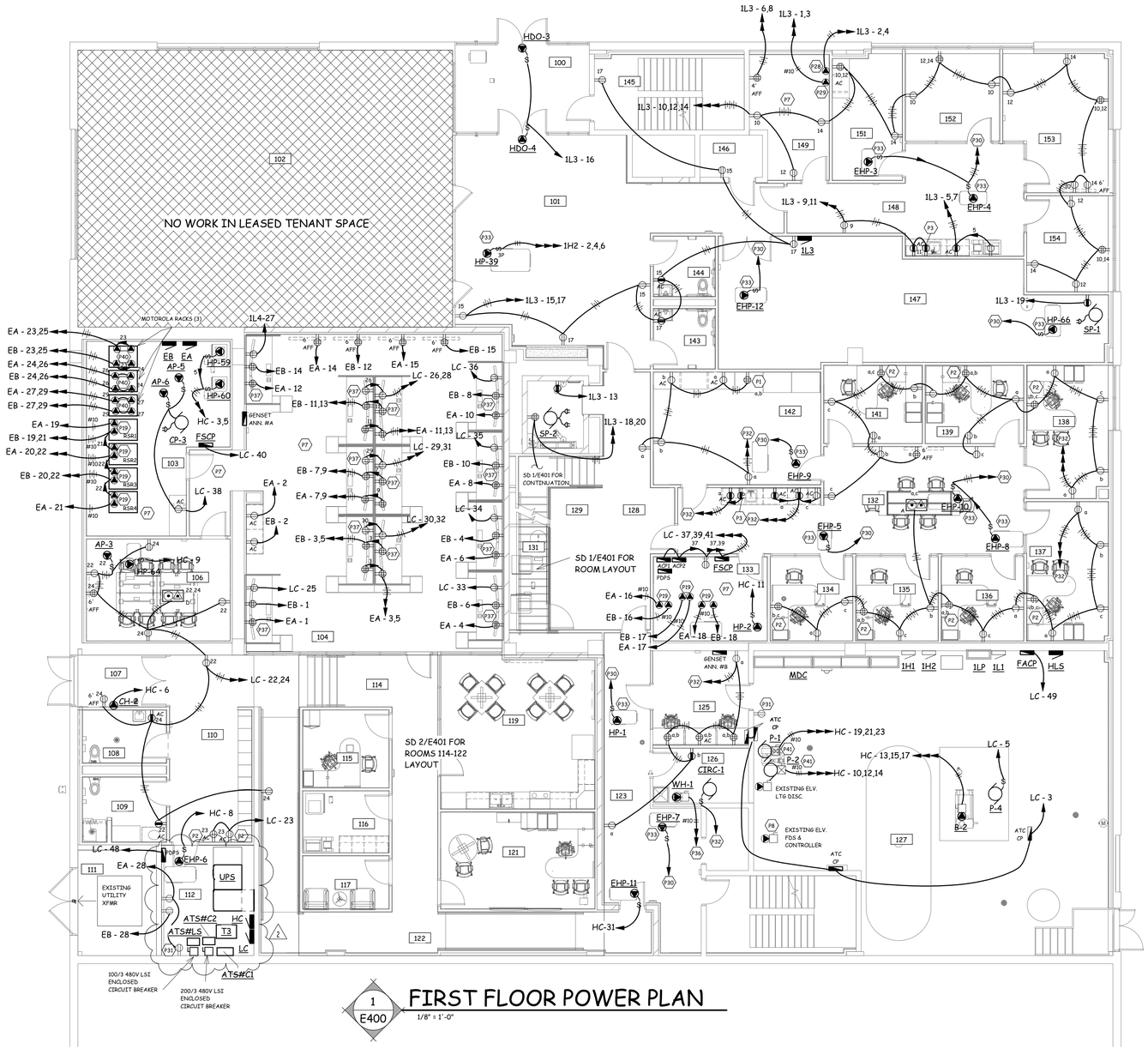
REVISION SCHEDULE

NO.	DESCRIPTION	DATE
1	Addendum #1	11/12/21

CITY OF MINOT
MINOT CITY HALL RENOVATION
MINOT, ND

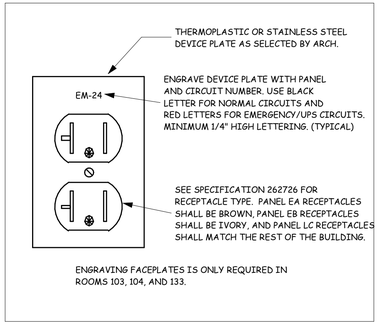
CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21018
SHEET E302
THIRD FLOOR LIGHITNG PLAN

11/12/2021 11:11:00 AM

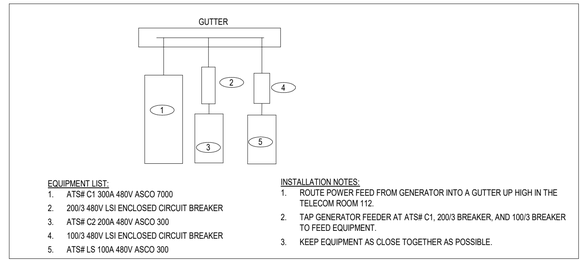


1 E400 **FIRST FLOOR POWER PLAN**
1/8" = 1'-0"

Keynote Legend	
Key Value	Keynote Text
P1	MOUNT RECEPTACLE IN CABINET FOR EQUIPMENT/CHARGER POWER. FIELD COORDINATE EXACT MOUNTING HEIGHT WITH G.C. AND CABINETRY SUPPLIER.
P2	ONE DUPLEX RECEPTACLE WITH USB TYPE A & C CONNECTORS. LEVITON MODEL# T5833 OR EQUIVALENT. COLOR AS SELECTED BY ARCHITECT.
P3	MOUNT UNDERCABINET FRIDGE RECEPTACLE IN ADJACENT CABINET FOR ACCESSIBILITY. COORDINATE WITH G.C. AND CABINET SUPPLIER FOR GROMMET HOLE TO FRIDGE AREA.
P7	ROOM CONTAINS STATIC DISSIPATING FLOORING. FIELD COORDINATE FLOOR GROUNDING REQUIREMENTS WITH G.C. AND FLOORING SUPPLIER.
P8	DISCONNECT EXISTING ELEVATOR CONTROLLER AND FDS FOR REPLACEMENT WITH NEW EQUIPMENT. PROVIDE NEW ELEVATOR DISCONNECT IN COMPLIANCE WITH SPECIFICATION 262822. EXTEND EXISTING CIRCUITRY AS REQUIRED TO CONNECT NEW DISCONNECT AND CONTROLLER.
P19	PROVIDE NEMA L5-30 RECEPTACLE MOUNTED ABOVE SERVER OR DATA RACK FOR PDU POWER.
P28	PROVIDE AND INSTALL RECEPTACLE CONFIGURATION TO MATCH DATA RACK AIR CONDITIONER FROM KEYNOTE D11 DETAIL 1/E202.
P29	CONNECT DIRECT WIRED 30A 208V RACK MOUNTED UPS.
P30	CONNECT TO EXISTING 20/1 BREAKER(S) IN PANEL 1H2 FOR POWER.
P31	REPLACE EXISTING DUPLEX RECEPTACLE WITH GFCI RECEPTACLE.
P32	CONNECT TO EXISTING 20/1 BREAKER(S) IN PANEL 1L1 FOR POWER.
P33	UNDER ALTERNATE #6, CONNECT M.C. PROVIDED AP-X TO SPARE 20/1 BREAKER(S) IN PANEL 1L1 OR 1L3 FOR POWER.
P36	PROVIDE AND INSTALL A SQUARE D TYPE QO 30/2 BREAKER IN PANEL 1L1 FOR POWER.
P37	SURFACE MOUNT RECEPTACLES TO OWNER PROVIDED DESKS. FIELD VERIFY LOCATION WITH DESK SUPPLIER. SD 2/E400 FOR RECEPTACLE COLOR AND ENGRAVING REQUIREMENTS.
P40	PROVIDE AND INSTALL NEMA L5-20 RECEPTACLES MOUNTED IN MOTOROLA'S SERVER OR DATA RACK FOR POWER. FIELD VERIFY RECEPTACLE CONFIGURATION AND LOCATION WITH VENDOR PRIOR TO INSTALLING.
P41	PROVIDE AND INSTALL BELDEN MODEL# 29502, OR EQUIVALENT, #12 AWG VFD CABLE IN 1'' CONDUIT BETWEEN VFD AND MOTOR. SEE DETAIL 5/E100 AND SPECIFICATION 260519 FOR FURTHER DETAILS.



2 E400 **RECEPTACLE/PLATE IDENTIFICATION**
1/8" = 1'-0"



3 E400 **ATS ARRANGEMENT**
NTS

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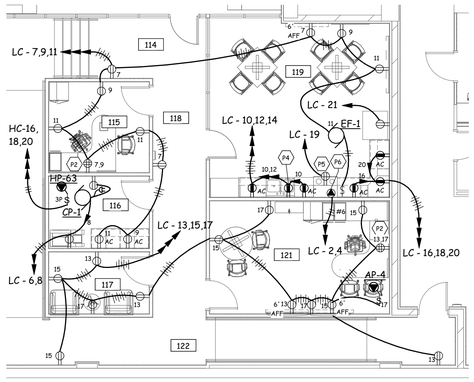
2	Addendum #2	11/18/21

CITY OF MINOT MINOT CITY HALL RENOVATION MINOT, ND

CITY PROJECT 4466
DATE
11/04/21
PHASE
CONSTRUCTION DOCUMENTS
PROJECT
21018
SHEET
E400
FIRST FLOOR POWER PLAN

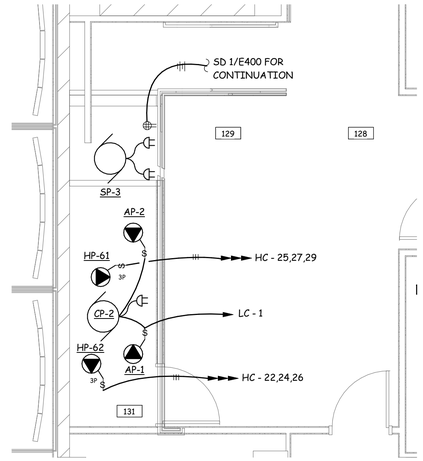
11/17/2021 2:35:04 PM



ROOM 114-122 ENLARGED VIEW

2 / E401

1/8" = 1'-0"



ROOM 131 ENLARGED VIEW

1 / E401

1/4" = 1'-0"

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MINOT, ND

CITY PROJECT 4466

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21018

SHEET
E401
ENLARGED ROOM POWER DETAILS

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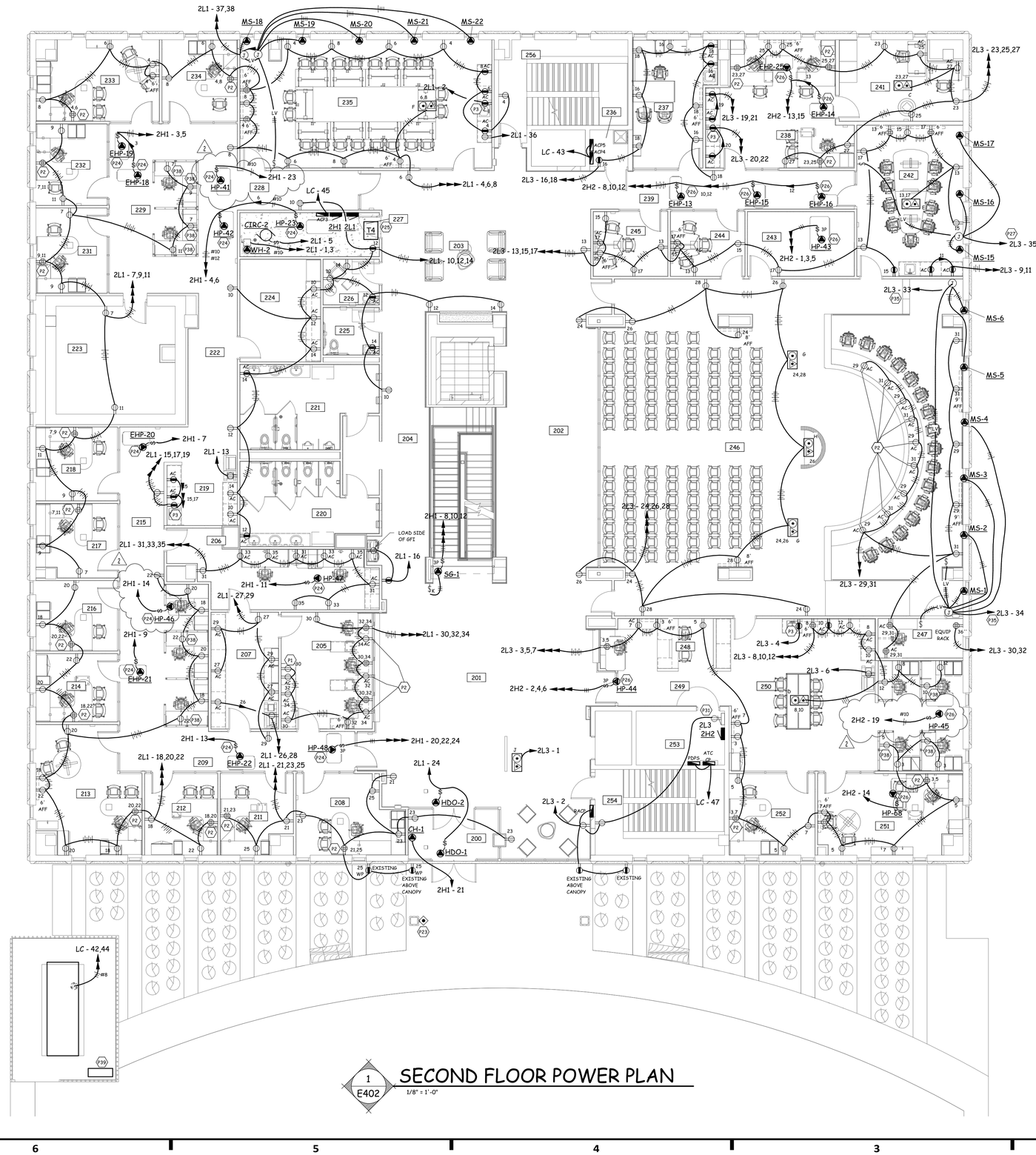
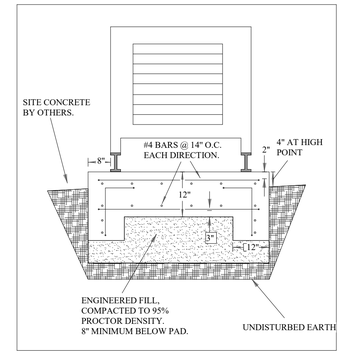


SECOND FLOOR POWER PLAN

1 / E402 — 1/8" = 1'-0"

Keynote Legend	
Key Value	Keynote Text
P1	MOUNT RECEPTACLE IN CABINET FOR EQUIPMENT/CHARGER POWER. FIELD COORDINATE EXACT MOUNTING HEIGHT WITH G.C. AND CABINETRY SUPPLIER.
P2	ONE DUPLEX RECEPTACLE WITH USB TYPE A & C CONNECTORS. LEVITON MODEL# T5833 OR EQUIVALENT. COLOR AS SELECTED BY ARCHITECT.
P3	MOUNT UNDERCABINET FRIDGE RECEPTACLE IN ADJACENT CABINET FOR ACCESSIBILITY. COORDINATE WITH G.C. AND CABINET SUPPLIER FOR GROMMET HOLE TO FRIDGE AREA.
P23	PROVIDE WIREMOLD SURFACE MOUNT BOX FOR WIRELESS HANDICAP OPERATOR PUSHBUTTON. PAINT BOX TO MATCH COLUMN.
P24	UNDER ALTERNATE #6, CONNECT M.C. PROVIDED AP-X TO SPARE 20/1 BREAKER(S) IN PANEL 2L1 FOR POWER.
P25	FIELD COORDINATE WITH M.C. AND G.C. TO HANG TRANSFORMER ABOVE DOOR AS HIGH AS POSSIBLE. SEE STRUCTURAL DETAIL 5/S702 AND 1/E108 FOR HANGING SUPPORT REQUIREMENTS.
P26	UNDER ALTERNATE #6, PROVIDE ONE SQUARE D TYPE QO 20/1 BREAKER IN PANEL 2L3 FOR AP-X POWER. CONNECT M.C. PROVIDED AP-X TO THIS NEW CIRCUIT.
P27	PROVIDE AND INSTALL A SQUARE D TYPE QO 20/1 BREAKER IN PANEL 2L3 FOR POWER.
P31	REPLACE EXISTING DUPLEX RECEPTACLE WITH GFCI RECEPTACLE.
P35	PROVIDE AND INSTALL A SQUARE D TYPE QO 20/1 BREAKER IN PANEL 2L3 FOR POWER. MOTORIZED SHADES MUST BE ON THE SAME PHASE WHEN GROUPED TOGETHER FOR CONTROL.
P38	FIELD COORDINATE FURNITURE SYSTEM FEED POINT LOCATION WITH G.C. AND FURNITURE SUPPLIER.
P39	E.C. TO PROVIDE A FIELD FABRICATED STAND FOR GENERATOR MAINTENANCE CABINET. SD 1/E106 FOR ADDITIONAL DETAILS ON THE GENERATOR MAINTENANCE CABINET.



GENSET PAD DETAIL

2 / E402 — 1/8" = 1'-0"

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MINOT CITY HALL RENOVATION
MINOT, ND

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DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21018
SHEET **E402**
SECOND FLOOR POWER PLAN

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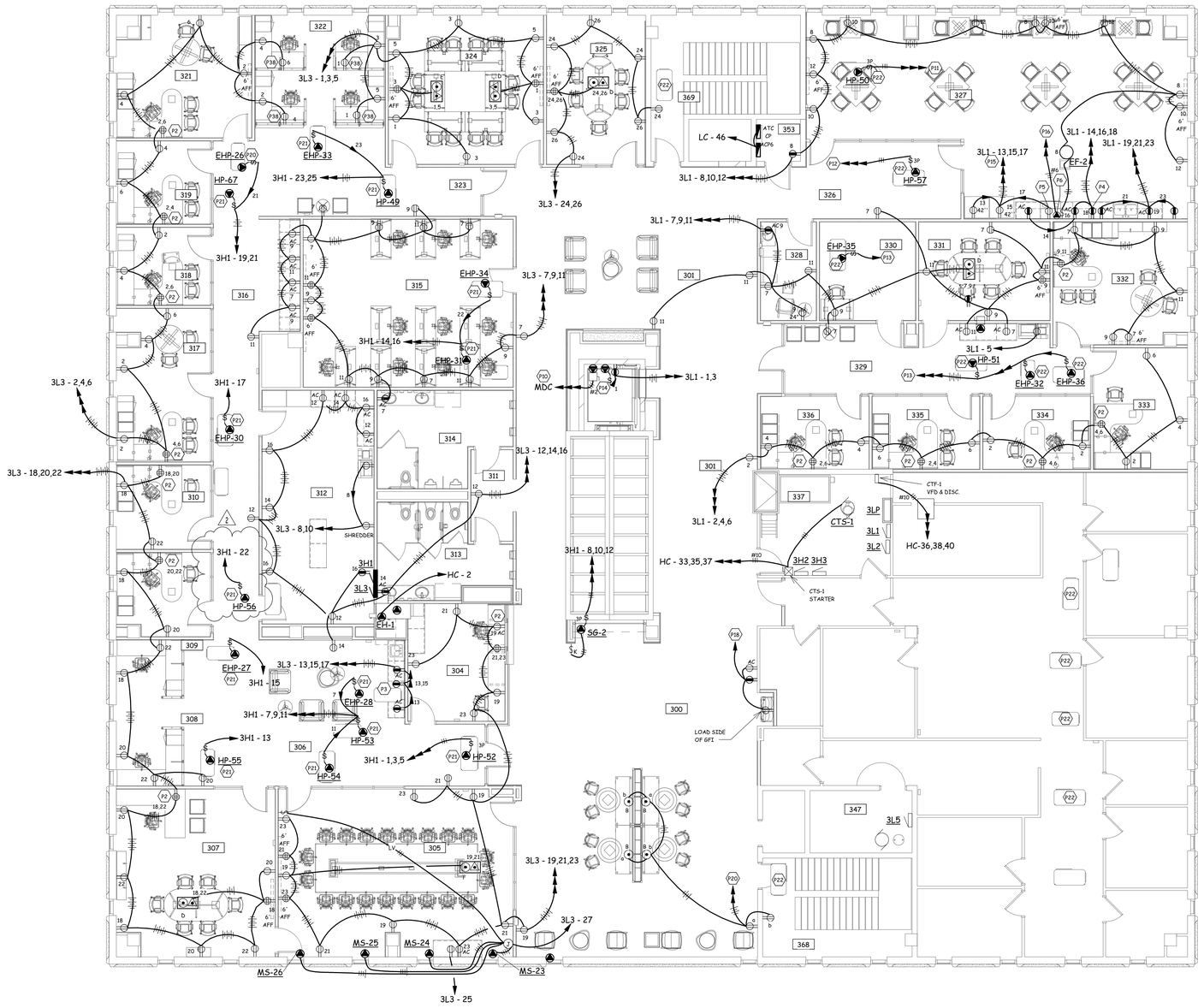

1 E403 THIRD FLOOR POWER PLAN
1/8" = 1'-0"

2 E403 ALTERNATE #4 POWER PLAN
1/8" = 1'-0"

Keynote Legend

Key Value	Keynote Text
P2	ONE DUPLEX RECEPTACLE WITH USB TYPE A & C CONNECTORS. LEVITON MODEL# T5833 OR EQUIVALENT. COLOR AS SELECTED BY ARCHITECT.
P3	MOUNT UNDERCABINET FRIDGE RECEPTACLE IN ADJACENT CABINET FOR ACCESSIBILITY. COORDINATE WITH G.C. AND CABINET SUPPLIER FOR GROMMET HOLE TO FRIDGE AREA.
P4	MOUNT DISHWASHER RECEPTACLE IN ADJACENT CABINET FOR ACCESSIBILITY. COORDINATE WITH G.C. AND CABINET SUPPLIER FOR GROMMET HOLE TO FRIDGE AREA.
P5	FIELD VERIFY RECEPTACLE MOUNTING HEIGHT FOR MICROWAVE/RANGE HOOD.
P6	PROVIDE AND INSTALL NEMA 14-50 RECEPTACLE FOR RANGE.
P10	CONNECT TO EXISTING 100/3 FDS IN MDC FOR THE NORTH ELEVATOR FOR POWER. INSTALL FUSES AS REQUIRED PER ELEVATOR NAMEPLATE MOPD. SEE DETAIL 4/E103 AND SPECIFICATION 262822 FOR FURTHER DETAILS.
P11	CONNECT TO EXISTING 15/3 BREAKER IN PANEL 3H2 FOR POWER.
P12	CONNECT TO EXISTING 20/3 BREAKER IN PANEL 3H2 FOR POWER.
P13	CONNECT TO EXISTING 20/1 BREAKER(S) IN PANEL 3H2 FOR POWER.
P14	ELEVATOR CAB LIGHTING DISCONNECT. SEE SPECIFICATION 262822.
P15	PROVIDE AND INSTALL SQUARE D TYPE QO 20/1 GFCI (5MA) BREAKER IN PANEL 3L1 FOR POWER.
P16	PROVIDE AND INSTALL SQUARE D TYPE QO 50/2 GFCI (5MA) BREAKER IN PANEL 3L1 FOR POWER.
P18	CONNECT TO EXISTING WATER FOUNTAIN CIRCUIT IN PANEL 3L2 FOR POWER.
P20	CONNECT TO SPARE 20/1 BREAKER(S) IN PANEL 3L2 FOR POWER.
P21	UNDER ALTERNATE #6, CONNECT M.C. PROVIDED AP-X TO SPARE 20/1 BREAKER(S) IN PANEL 3L3 FOR POWER.
P22	UNDER ALTERNATE #6, CONNECT M.C. PROVIDED AP-X TO SPARE 20/1 BREAKER(S) IN PANEL 3L1 FOR POWER.
P34	UNDER ALTERNATE #4 PROVIDE POWER AND LOW VOLTAGE WIRING FOR G.C. INSTALLED MOTORIZED SHADE SYSTEM. MINIMIZE THE AMOUNT OF EXPOSED CONDUIT TO THE EXTENT POSSIBLE. CONNECT TO SPARE 20/1 BREAKERS IN PANEL 3L3 FOR POWER. MOTORIZED SHADES MUST BE ON THE SAME PHASE WHEN GROUPED TOGETHER FOR CONTROL.
P38	FIELD COORDINATE FURNITURE SYSTEM FEED POINT LOCATION WITH G.C. AND FURNITURE SUPPLIER.

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MINOT, ND

CITY PROJECT 4466
DATE 11/04/21
PHASE CONSTRUCTION DOCUMENTS
PROJECT 21018
SHEET E403
THIRD FLOOR POWER PLAN

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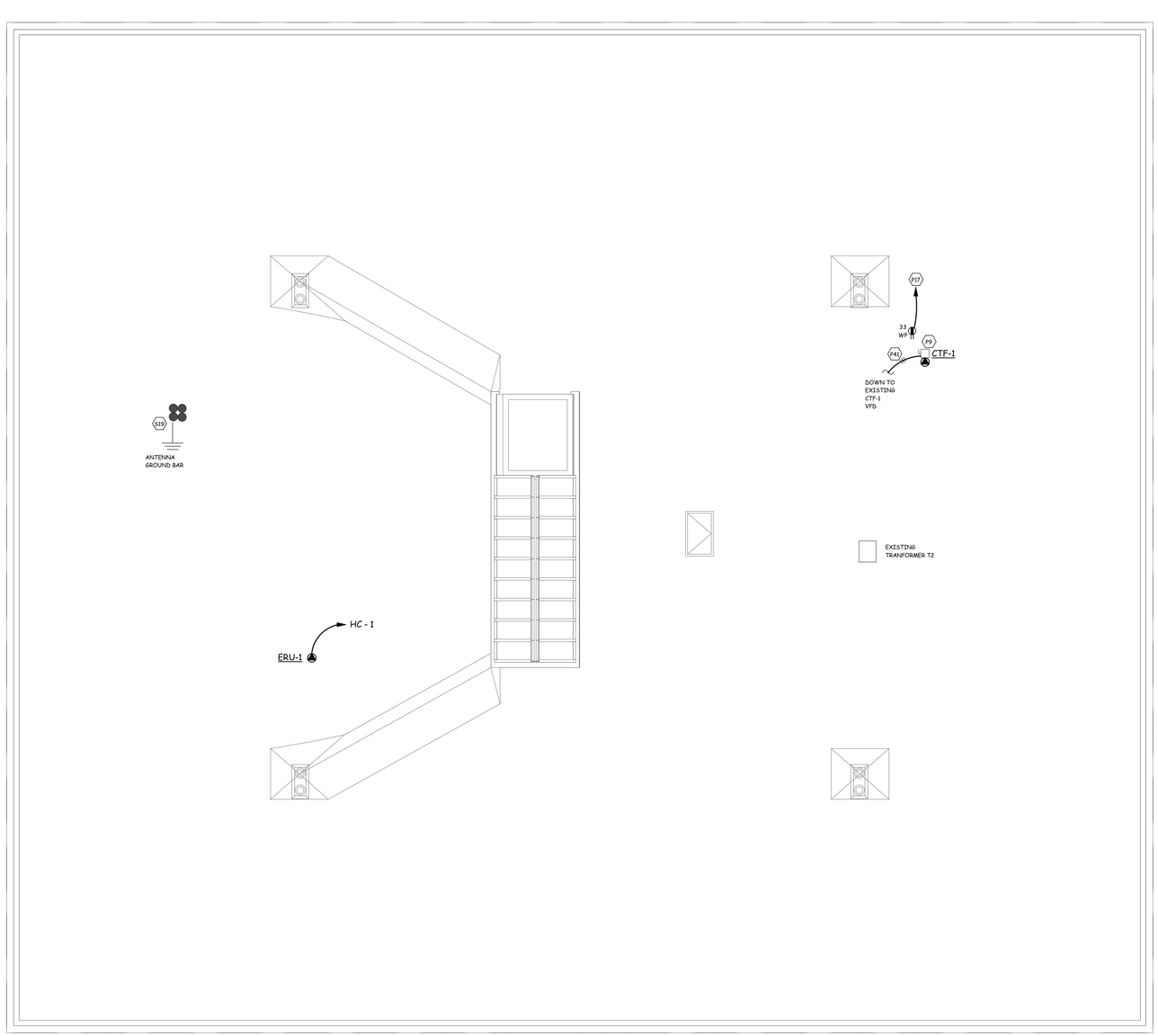
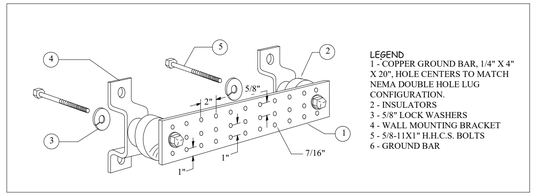


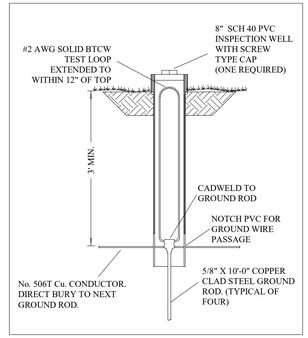
ROOF ELECTRICAL PLAN
1/8" = 1'-0"

Keynote Legend	
Key Value	Keynote Text
P9	PROVIDE AND INSTALL 30/3 NEMA 3R FDS WITH AUX CONTACT FOR COOLING TOWER FAN LOCAL DISCONNECT. CONNECT VFD RUN ENABLE CIRCUIT THROUGH CONTACT TO INTERRUPT VFD WHEN EXTERIOR DISCONNECT IS IN THE OPEN POSITION.
P17	CONNECT TO EXISTING ROOF RECEPTACLE CIRCUIT IN PANEL 3L2 FOR POWER.
P41	PROVIDE AND INSTALL BELDEN MODEL# 29502, OR EQUIVALENT, #12 AWG VFD CABLE IN 1'' CONDUIT BETWEEN VFD AND MOTOR. SEE DETAIL 5/E100 AND SPECIFICATION 260519 FOR FURTHER DETAILS.
S19	PROVIDE ANTENNA GROUNDING SYSTEM ON ROOF. SEE DETAIL 2/E403 FOR GROUND BAR. INSTALL NUMBER 506T CONDUCTOR FROM GROUND BAR TO GROUND RING ON DETAIL 1/E501. CONDUCTOR SHALL BE IN 1'' PVC RACEWAY WITHIN THE BUILDING.



LEGEND
1 - COPPER GROUND BAR, 1/4" X 4" X 20", HOLE CENTERS TO MATCH NEMA DOUBLE HOLE LUG CONFIGURATION.
2 - INSULATORS
3 - 5/8" LOCK WASHERS
4 - WALL MOUNTING BRACKET
5 - 5/8-11X1" H.H.C.S. BOLTS
6 - GROUND BAR

GROUND BAR DETAIL
2 / E404
NTS



INSPECTION WELL DETAIL
3 / E404
NTS

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21018
SHEET
E404
ROOF ELECTRICAL PLAN

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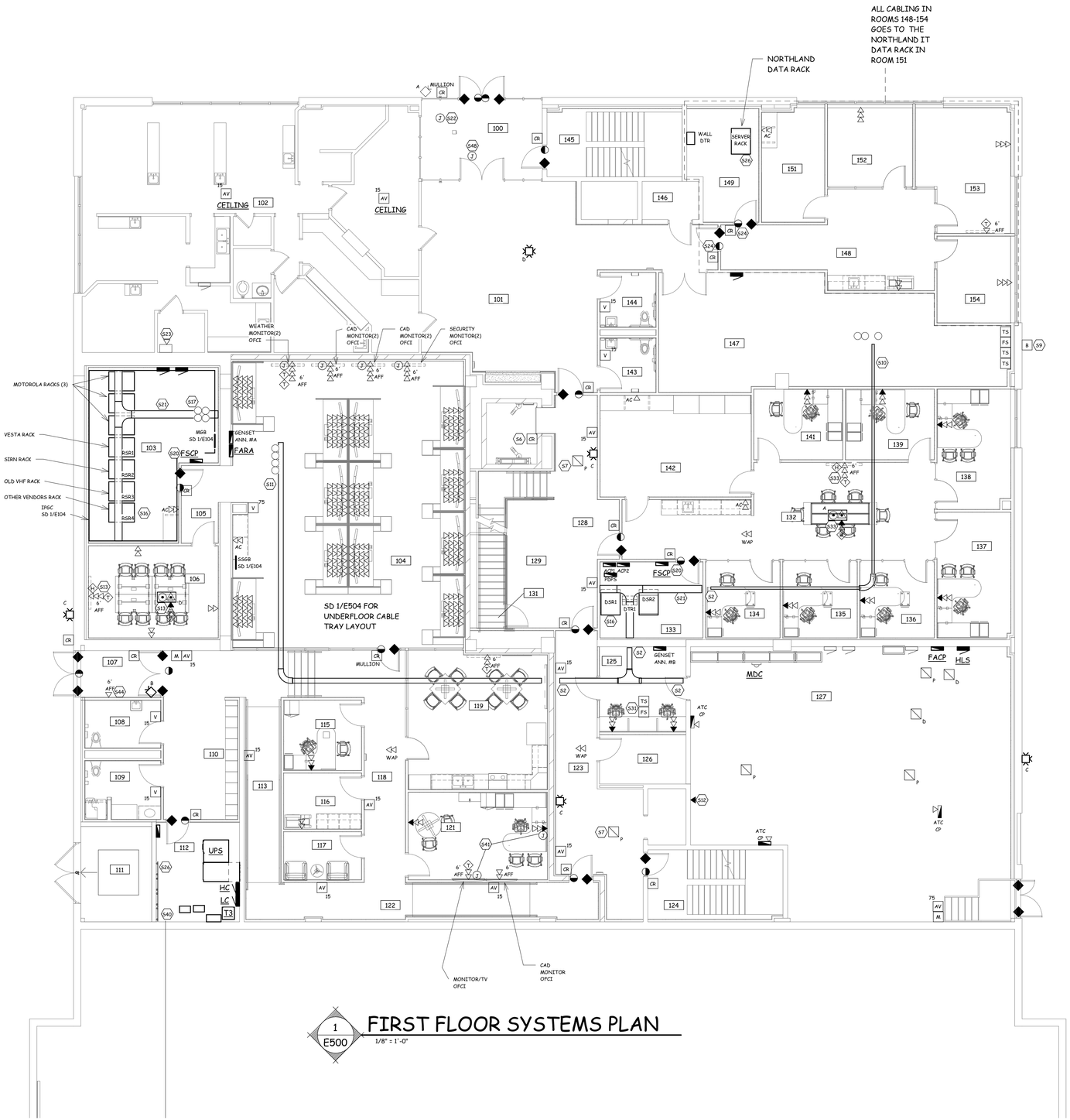

1 E500 FIRST FLOOR SYSTEMS PLAN

1/8" = 1'-0"

Keynote Legend

Key Value	Keynote Text
S2	PROVIDE FIRE RATED PASS THROUGH FOR CABLE TRAY AT THIS LOCATION. QUANTITY BASED ON TRAY SIZE AS PER SPECIFICATION 260536.
S6	INTERFACE CONTROLLED ACCESS SYSTEM WITH ELEVATOR CONTROLS.
S7	ELEVATOR LOBBY SMOKE DETECTOR. SEE SPECIFICATION 262822.
S9	FIRE SPRINKLER BELL. SEE SPECIFICATION 283111.
S10	4'' X 4'' BASKET CABLE TRAY. SEE SPECIFICATION 260536.
S11	4'' X 8'' BASKET CABLE TRAY. SEE SPECIFICATION 260536.
S12	ELEVATOR TELEPHONE SERVICE. SEE SPECIFICATION 262822.
S13	SD 2/E109 AND SPECIFICATION 275110 FOR CONFERENCE ROOM MULTIMEDIA SYSTEM REQUIREMENTS.
S16	PROVIDE AND INSTALL 12-STRAND MULTIMODE FIBER BETWEEN CITY DATA RACK AND PSAP DATA RACK FOR CONNECTION TO CITY NETWORK.
S17	FOUR 4'' CONDUITS ROUTED ABOVE CEILING TO ABOVE ROOF FOR ANTENNA CABLING BY OTHERS. FIRE SEAL PENETRATIONS INTO VAULT.
S20	PROVIDE IAMS AS REQUIRED TO INTERCONNECT FIRE SUPPRESSION CONTROL PANEL WITH EXISTING SIMPLEX 4010 FIRE ALARM SYSTEM IN THE BUILDING. SEE SPECIFICATION 283111 FOR FURTHER DETAILS.
S21	CABLE RUNWAY AS PER SPECIFICATION 260536.
S22	PROVIDE AND INSTALL RELAYS AS REQUIRED TO INTERFACE ACCESS CONTROL SYSTEM WITH HANDICAP DOOR OPERATORS. EXIT DOOR PUSHBUTTON RELAY SHALL AUTOMATICALLY TRIGGER ELECTRIFIED STRIKE. ENTRANCE DOOR BUTTON RELAY SHALL DISABLE OPERATOR UNLESS STRIKE IS ENERGIZED.
S23	PROVIDE AND INSTALL SINGLE CAT 6 BETWEEN DENTAL CLINIC DTR AND NORTHLAND IT SERVER RACK FOR COMMUNICATION.
S24	CONTACT PROTECH INTEGRATIONS LLC, 701-720-5730, TO INSTALL AN EXTENSION TO THE EXISTING NORTHLAND HEALTH DENTAL CLINIC CONTROLLED ACCESS SYSTEM FOR THIS DOOR AT THE NEW NORTHLAND IT OFFICE. E.C. TO PROVIDE ALL ROUGH-INS AND CABLING REQUIRED FOR A COMPLETE INSTALLATION. PROVIDE CAT 6 BETWEEN NORTHLAND IT CONTROLLED ACCESS DOORS AND SERVER RACK. SEE SPECIFICATION 281301 FOR FURTHER DETAILS.
S26	PROVIDE AND INSTALL A 1-1/2'' CONDUIT WITH PULL STRING BETWEEN ROOMS 151 AND 112 FOR NEW SRT FIBER DROP TO NORTHLAND IT DATA RACK.
S31	HYDRAULIC ELEVATOR SHAFT SPRINKLER FLOW SWITCH. FIELD VERIFY LOCATION WITH SPRINKLER SYSTEM INSTALLER.
S33	SD 1/E109 AND SPECIFICATION 275110 FOR CONFERENCE ROOM MULTIMEDIA SYSTEM REQUIREMENTS.
S40	PROVIDE AND INSTALL 2'' CONDUIT BETWEEN ROOM 112 AND THE SOUTH PROPERTY LINE FOR NEW SRT FIBER LINE. FIELD COORDINATE WITH SRT FOR CONDUIT TERMINATION POINT.
S41	CONNECT THIS DATA DROP TO THE SURVEILLANCE SYSTEM POE SWITCH IN ROOM 133.
S44	STUB A 1-1/2'' CONDUIT DOWN TO BELOW THE RAISED ACCESS FLOOR FOR FUTURE CABLING BY OTHERS.
S48	PROVIDE AND INSTALL A 1FT X 1FT CEILING ACCESS HATCH WITH PAINTABLE COVER FOR ACCESS TO FLOOR BOX LOW VOLTAGE CABLING.

DISPATCH CABLING NOTES:

1. PRIOR TO INSTALLING ANY CABLING FIELD VERIFY QUANTITY OF DROPS PER SYSTEM TO EACH CONSOLE, DISPLAY, OR RACK LOCATION WITH EACH VENDOR.
2. THE AREA UNDER THE RAISED FLOORING IN THE PSAP AND DISPATCH AREA IS A PLENUM SPACE.
3. THE RADIO ROOM IS PROTECTED BY A GAS FIRE SUPPRESSION SYSTEM. ALL PENETRATIONS INTO THE RADIO ROOM SHALL BE FIRE SEALED.

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SHEET
E500
FIRST FLOOR SYSTEMS PLAN

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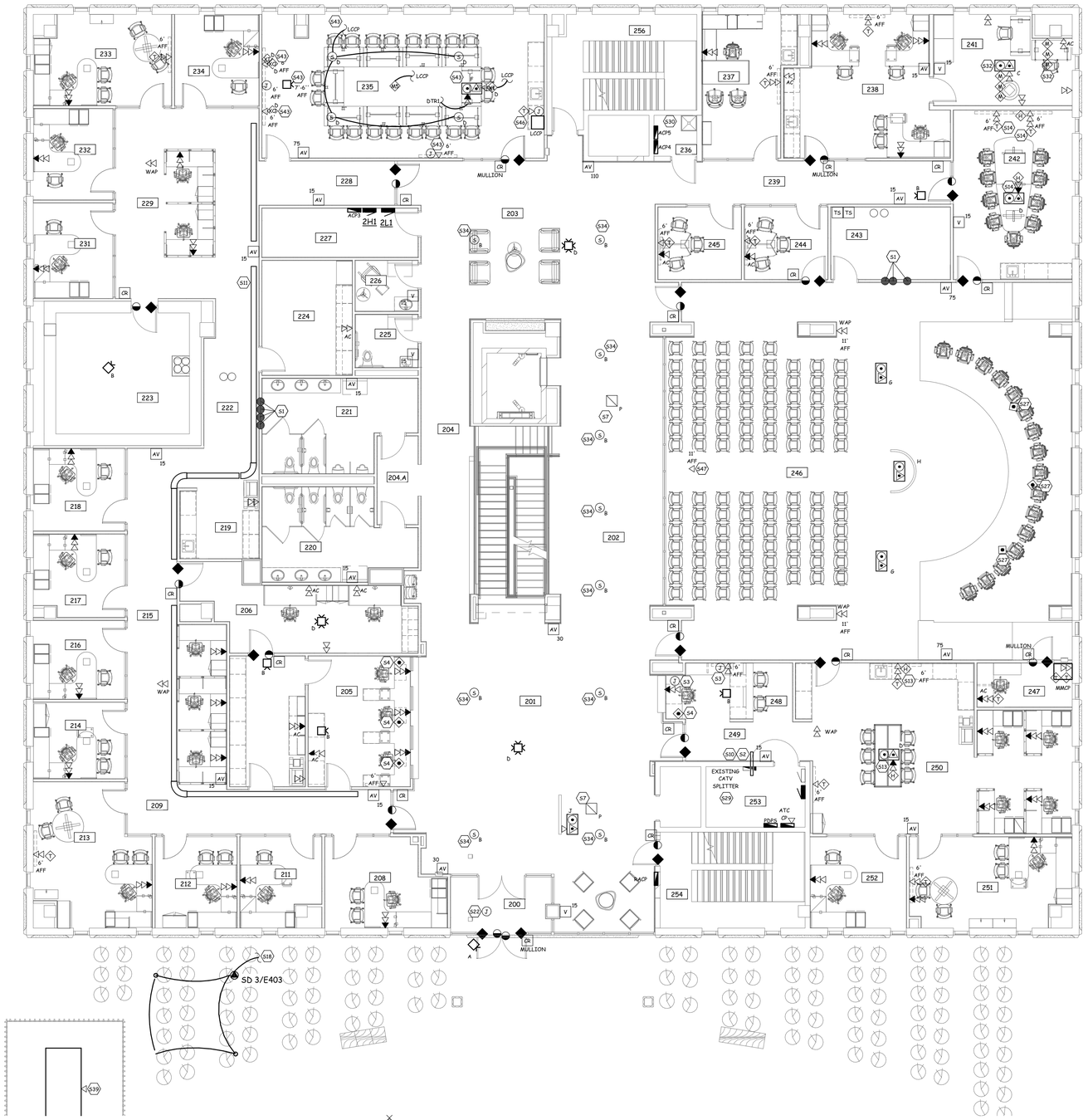

1 E501 SECOND FLOOR SYSTEMS PLAN
1/8" = 1'-0"

Keynote Legend

Key Value	Keynote Text
S1	PROVIDE 3'' CONDUIT FOR LOW VOLTAGE CABLING. STUB CONDUIT FROM ABOVE ACCESSIBLE CEILING ON FLOOR BELOW AND SWEEP ABOVE ACCESSIBLE CEILING ON THIS FLOOR FOR CABLING.
S2	PROVIDE FIRE RATED PASS THROUGH FOR CABLE TRAY AT THIS LOCATION. QUANTITY BASED ON TRAY SIZE AS PER SPECIFICATION 260536.
S3	PROVIDE TWO-GANG ROUGH-IN WITH GROMMET FACEPLATE WITH 1-1/2'' CONDUIT BETWEEN DESK AND WALL MONITOR LOCATION FOR HDMI CABLE.
S4	DOOR STRIKE MANUAL OVERRIDE PUSHBUTTON. WHERE LOCATED BELOW DESK COUNTERTOPS MOUNT TO UNDERSIDE OF DESK NEAR EDGE FOR ACCESSIBILITY.
S7	ELEVATOR LOBBY SMOKE DETECTOR. SEE SPECIFICATION 262822.
S10	4'' X 4'' BASKET CABLE TRAY. SEE SPECIFICATION 260536.
S11	4'' X 8'' BASKET CABLE TRAY. SEE SPECIFICATION 260536.
S13	SD 2/E109 AND SPECIFICATION 275110 FOR CONFERENCE ROOM MULTIMEDIA SYSTEM REQUIREMENTS.
S14	SD 4/E109 AND SPECIFICATION 275110 FOR A TWO TV CONFERENCE ROOM MULTIMEDIA SYSTEM REQUIREMENTS.
S18	UP TO ANTENNA GROUND ON ROOF. SEE DETAIL 1/E403 NOTE S19.
S22	PROVIDE AND INSTALL RELAYS AS REQUIRED TO INTERFACE ACCESS CONTROL SYSTEM WITH HANDICAP DOOR OPERATORS. EXIT DOOR PUSHBUTTON RELAY SHALL AUTOMATICALLY TRIGGER ELECTRIFIED STRIKE. ENTRANCE DOOR BUTTON RELAY SHALL DISABLE OPERATOR UNLESS STRIKE IS ENERGIZED.
S27	PROVIDE PANIC BUTTON MOUNTED BELOW THE COUNTER TOP TO UNLOCK DOORS 242B AND 250.
S29	PROVIDE AND INSTALL TWO RG-11 BACK BONE CABLES TO ROOM 112.
S30	INSTALL CABLE TV SPLITTERS IN THIS JANITOR ROOM FOR 2ND FLOOR NORTH DISTRIBUTION. PROVIDE AND INSTALL TWO RG-11 BACK BONE CABLES TO ROOM 112.
S32	MOUNT COUNTER MICROPHONE JACKS ABOVE COUNTER. THESE JACKS ARE CONNECTED TO THE THREE XLR JACKS LOCATED IN THE FLOOR BOX. LABEL EACH CORRESPONDING JACK SO IT IS CLEAR WHICH JACKS ARE INTERCONNECTED.
S34	SUSPEND SO BOTTOM OF SPEAKER IS FLUSH WITH ADJACENT STRUCTURE.
S39	PROVIDE AND INSTALL WATERBLOCKED CAT 6 CABLE BETWEEN GENERATOR CONTROLLER AND IT DTR FOR REMOTE COMMUNICATION AND MONITORING OF GENSET
S43	SD 4/E111 AND SPECIFICATION 275111 FOR FURTHER INFORMATION.
S46	MOUNT EQUIPMENT RACK IN BASE CABINET. SD 4/E111 AND SPECIFICATION 275111 FOR FURTHER INFORMATION.
S47	PROVIDE AND INSTALL A 4-DIGIT SURFACE MOUNT GREEN LED POE DIGITAL CLOCK WITH 4'' TALL NUMBERS AND INTEGRAL WEB-INTERFACE AT 11' AFF, SAPLING MODEL# SBP-31S-404-OG OR EQUIVALENT.

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CITY PROJECT 4466

DATE 11/04/21

PHASE CONSTRUCTION DOCUMENTS

PROJECT 21018

SHEET **E501** SECOND FLOOR SYSTEMS PLAN

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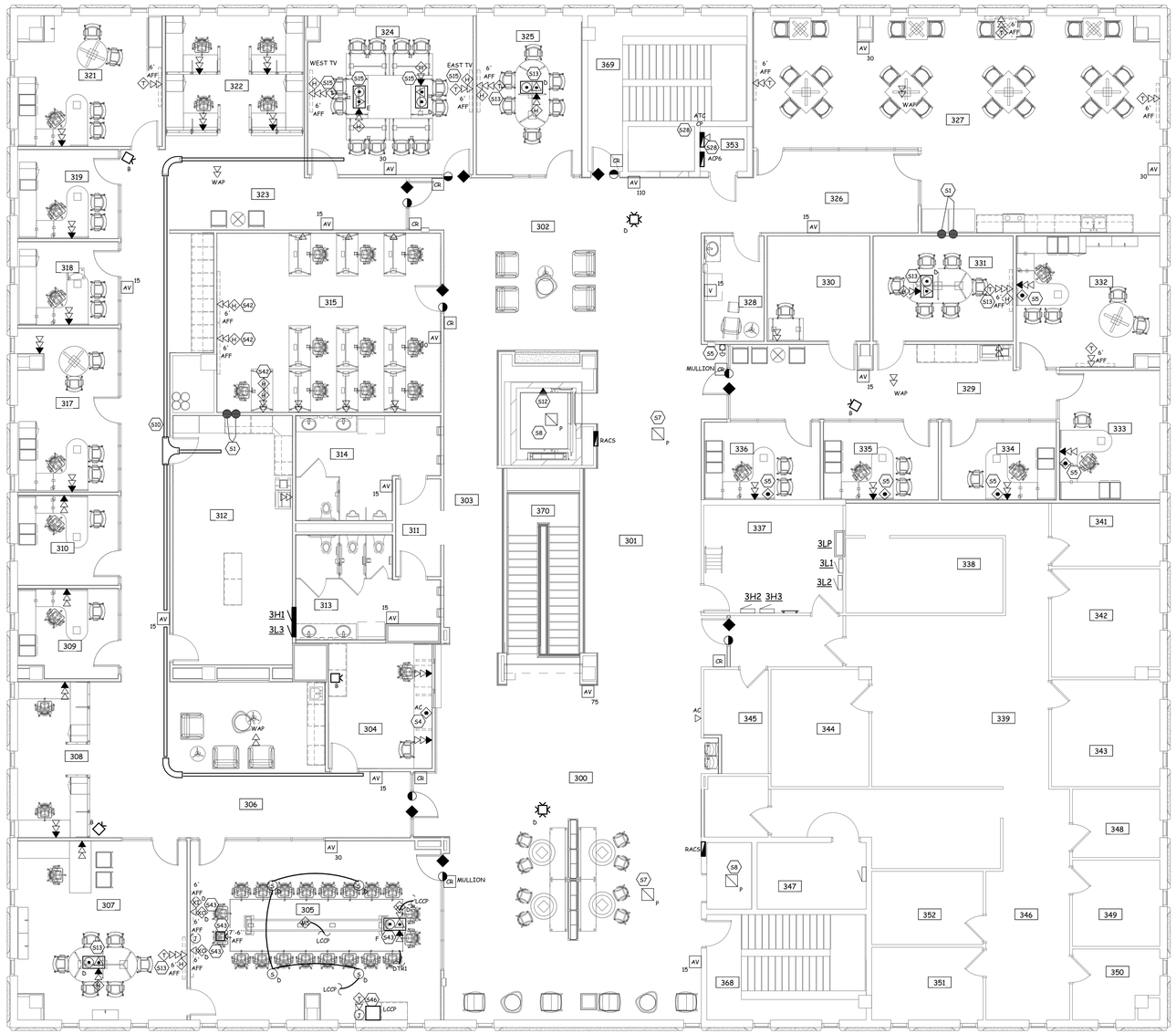

Keynote Legend

Key Value	Keynote Text
S1	PROVIDE 3'' CONDUIT FOR LOW VOLTAGE CABLING. STUB CONDUIT FROM ABOVE ACCESSIBLE CEILING ON FLOOR BELOW AND SWEEP ABOVE ACCESSIBLE CEILING ON THIS FLOOR FOR CABLING.
S4	DOOR STRIKE MANUAL OVERRIDE PUSHBUTTON. WHERE LOCATED BELOW DESK COUNTERTOPS MOUNT TO UNDERSIDE OF DESK NEAR EDGE FOR ACCESSIBILITY.
S5	PROVIDE AND INSTALL A 2N MODEL# 01357-001 IP BASED VIDEO INTERCOM STATION TO INTERFACE WITH DOOR 329 ELECTRIC STRIKE. PROVIDE NETWORK CABLE TO DEVICE WITH POE POWER. INSTALL FIVE (5) 2N MODEL# 01670-001 WIFI CONTROLLERS WITH DESKTOP BRACKETS IN EACH OFFICE.
S7	ELEVATOR LOBBY SMOKE DETECTOR. SEE SPECIFICATION 262822.
S8	ELEVATOR SHAFT SMOKE DETECTOR. SEE SPECIFICATION 262822.
S10	4'' X 4'' BASKET CABLE TRAY. SEE SPECIFICATION 260536.
S12	ELEVATOR TELEPHONE SERVICE. SEE SPECIFICATION 262822.
S13	SD 2/E109 AND SPECIFICATION 275110 FOR CONFERENCE ROOM MULTIMEDIA SYSTEM REQUIREMENTS.
S15	SD 1/E110 AND SPECIFICATION 275110 FOR CONFERENCE ROOM MULTIMEDIA SYSTEM REQUIREMENTS.
S28	INSTALL CABLE TV SPLITTERS IN THIS MECH ROOM FOR 3RD FLOOR DISTRIBUTION. PROVIDE AND INSTALL TWO RG-11 BACK BONE CABLES TO ROOM 112.
S42	SD 2/E110 AND SPECIFICATION 275110 FOR FURTHER INFORMATION.
S43	SD 4/E111 AND SPECIFICATION 275111 FOR FURTHER INFORMATION.
S46	MOUNT EQUIPMENT RACK IN BASE CABINET. SD 4/E111 AND SPECIFICATION 275111 FOR FURTHER INFORMATION.

1 E502 THIRD FLOOR SYSTEMS PLAN

1/8" = 1'-0"

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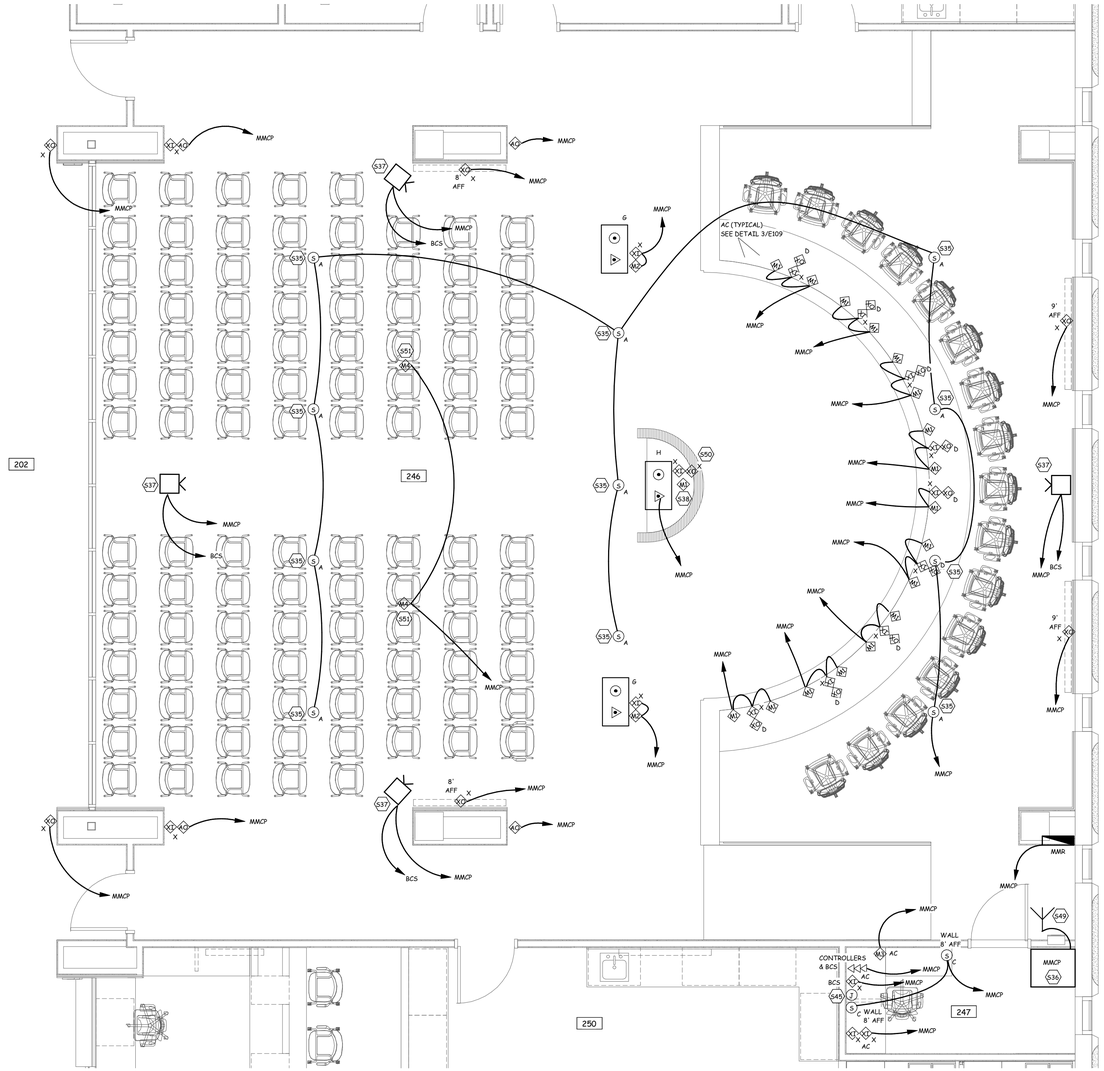
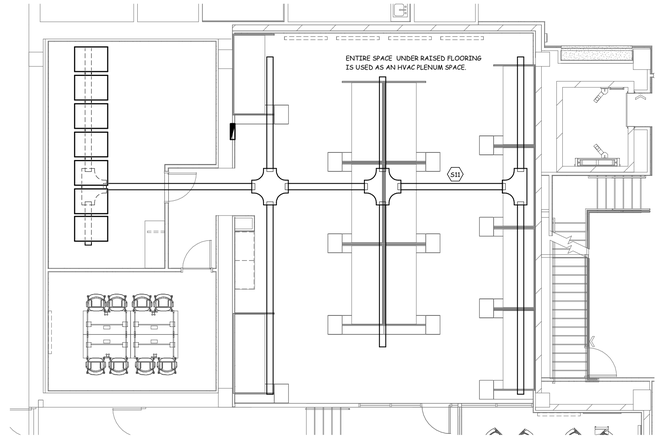


SECOND FLOOR ENLARGED COUNCIL CHAMBER

2 / E503

1/4" = 1'-0"



PSAP UNDERFLOOR CABLE TRAY

1 / E503

1/8" = 1'-0"

Keynote Legend	
Key Value	Keynote Text
S11	4'' X 8'' BASKET CABLE TRAY. SEE SPECIFICATION 260536.
S35	SUSPEND SO BOTTOM OF SPEAKER IS FLUSH WITH ADJACENT CEILING.
S36	CABINET BASE SHALL BE RECESSED 8" BELOW RAISED FLOOR TO ALLOW CONDUITS TO BE DIRECTLY ROUTED TO THE COUNCIL TABLE. ALONG WITH THE REQUIRED CONDUITS FOR THE MULTIMEDIA SYSTEM, PROVIDE ONE SPARE 1" CONDUIT TO EACH OF THE EIGHT ACCESS PANELS IN THE COUNCIL TABLE.
S37	MOUNT BROADCAST CAMERA SURFACE CEILING. SEE SPECIFICATION 275117 FOR CAMERA INFORMATION. INSTALL NETWORK CABLE TO MMCP. INSTALL COAX CABLE WITH BNC CONNECTORS TO BCS ON THE COUNTER IN ROOM 247 VIA KEYNOTE S45 ROUGH-IN.
S38	MOUNT M1 MICROPHONE JACK IN PODIUM TOP AND PROVIDE PATCH CORD TO FLOORBOX, ENSURING CLEARANCE FOR ROTATING PODIUM STAND. INSTALL ONE THREE-CONTACT XLR MIC JACK IN THE FLOORBOX.
S45	SINGLE GANG ROUGH IN ABOVE COUNTER WITH 1-1/2" CONDUIT STUB FOR THE BROADCAST CAMERA CABLES. PROVIDE GROMMETED FACEPLATE.
S49	WALL MOUNT PERSONAL PA ANTENNA AND WIRELESS MIC ANTENNA AT 8' AFF.
S50	MOUNT CABLE CUBBY IN PODIUM TOP AND PROVIDE PATCH CORDS TO FLOORBOX, ENSURING CLEARANCE FOR ROTATING PODIUM STAND. CLEARLY LABEL THE INPUT AND OUTPUT HDMI CABLES. INSTALL ONE XI AND XO OUTLETS IN THE FLOORBOX.
S51	MOUNT TRANSMITTER ABOVE CEILING AND SUSPEND MICROPHONE THROUGH CEILING TO 12' AFF.

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SHEET
E503
ENLARGED ROOM SYSTEM DETAILS

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